

MAIN BOOK
PRIMARY
SECOND TERM

BY: AHMED OMARA

Contents

Theme 3: Protecting Our Planet

Unit 3 Energy and Fuel



Concept 1 Devices and Energy

Lesson 1 ______9

Lesson 2 _____18

Lesson 3 _____27

Lesson 4 _____36

Concept 2 About Fuel

Lesson 1 _____46

Lesson 2 _____54

Lesson 3 _____67

Lesson 4 ______75

Lesson 5 _____79

Renewable Energy Resources

Lesson 1 ______90

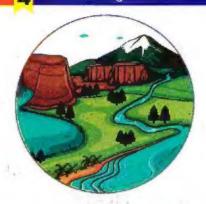
Lesson 2 _____102

Lesson 3 _____109

Lesson 4, ____113

Theme 4: Change and Stability

Unit A Shifting Surfaces



Concept 1 Breaking Down and Moving Rocks

Lesson 1 _____124

Lesson 2 _____131

Lesson 3 _____145

Lesson 4 _____151

Lesson 5 _____155

Concept 2 Changing Landscapes

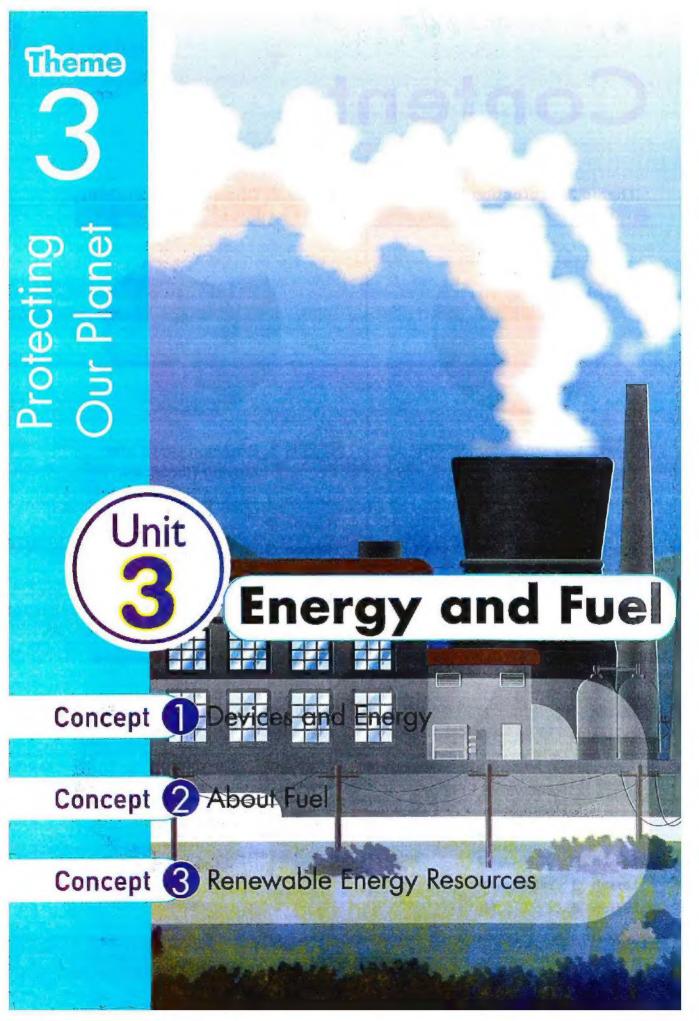
Lesson 1 _____165

Lesson 2 _____170

Lesson 3 _____175

Lesson 4 _____181

Lesson 5 _____183



Get Started What I Already Know

>> Humans use many forms of fuel in their daily lives, such as:





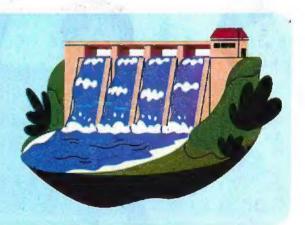


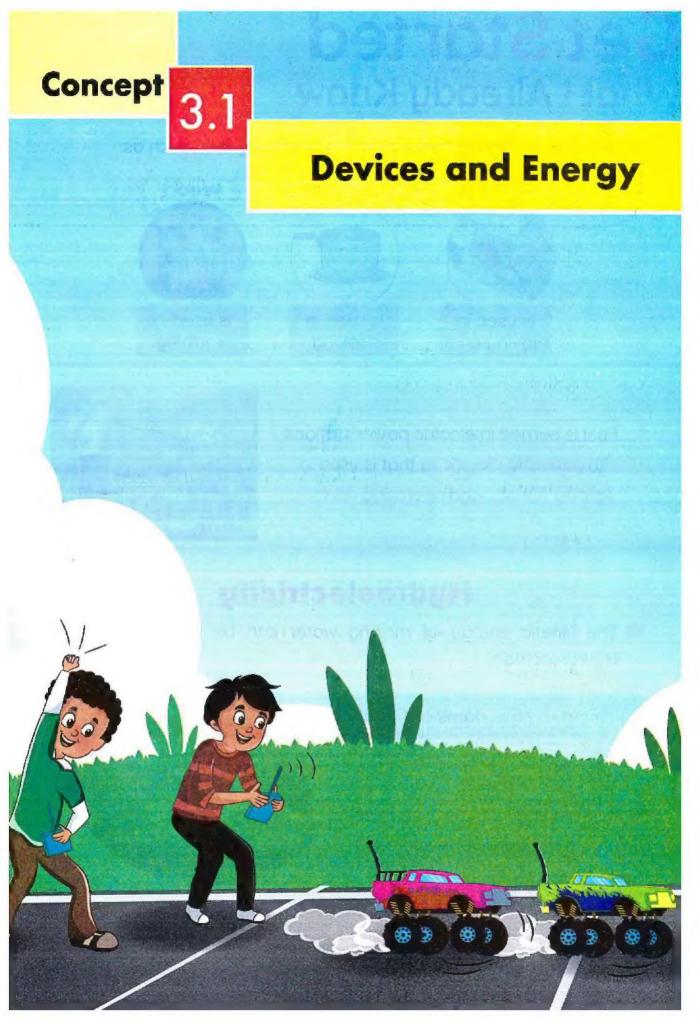
Fuel is burned in electric power stations to generate electricity that is used in lighting houses and operating devices.



Hydroelectricity

- >> The kinetic energy of moving water can be used to generate Hydroelectricity.
 - In modern time, dams are used to increase the kinetic energy of water.
 - Fast-moving water is used to spin large turbines, which generate Hydroelectricity.





Concept 1

Devices and Energy

| | - spatial |
|------------------------|--|
| | Lesson 1 |
| Activity 1 | Can You Explain? |
| Activity 2 | Energy in Remote-Controlled Cars |
| Activity 3 | Mars Rover |
| | SAFERIAL SECTION OF THE SECTION OF T |
| (militaria in initia | Lesson 2 |
| Activity 4 | What Do You Already Know About Devices and Energy? |
| Activity 5 | Energy Chains |
| The special section is | AND AND THE STATE OF THE STATE |
| Esta Visita Visita | Lesson 3 |
| Activity 6 | Energy and Everyday Devices |
| Activity 7 | The Conservation of Energy |
| A CONTRACTOR | and the second of the second o |
| STATE | Lesson 4 |
| Activity 8 | Follow the Flow |
| Activity 9 | Build an Energy Chain |
| Activity 10 | Record Evidence Like a Scientist: Energy in Remote-Controlled Cars |

Glossary

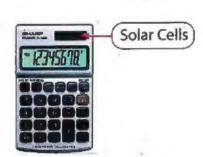
| | | Lesso | n 1 | | |
|------------------|---------------------------------|--|----------------------|--|--------------------------|
| Activi | ty 1 | | SCHOOL SERVICE | | |
| Devices | | Technology | تكنولوجيا | Convert | يتحول |
| Activi | ty 2 | | | | |
| Remote-control | led cars سیارات تعمل بالتحکم | Chemical energy | الطاقة الكيميائية ال | Transform | تمول |
| Truck | شيرات نعمل بالتحكم شاحنة | Plane | مائرة | Boat | ئارپ |
| Remotely-opera | تعمل عن نُقُد ited | Tasks | nlan | Turning corner | لانعطاف |
| Battery | بطارية | Store | يخزن | 3 | Special services |
| Activi | ty 3 | | | | |
| Sensors | مستشعرات | Electrical energy | الطاقة الكهربائية إ | Sound energy | الطاقة الصرتية |
| Run out | يثقذ | Recharge | إعادة شحن | Replace | استبدال |
| Spacecraft | مركبة فضائية | Missions | بعثات | Socket/Plug | ىقىس |
| Mars Curiosity P | lover عربة اكتشاف المريخ | - | | | |
| | | Lesso | n 2 | 1977 | |
| Activi | ly 4 | | | | and the fall of the same |
| Consumed ener | الطاقة المستهلكة 99 | Input energy | منخلات الطاقة | Produced energy | لطاقة الناتجة |
| Output energy | مخرجات الطاقة | Hair dryer | مجقف شعر | Soap dispenser | موزع الصابون |
| Activi | | | | | |
| Movement | حركة | Leaks out | يتسرب | Rubbing | حتكاله |
| Growth | ثمو | Copper | نحاس | Wood | نفت المحالات |
| Burn | حرق | Release | ينتج | Coal | · pin |
| Remains | إياليا | Electrical wires | أسلاك كهربائية | Electrical wire | ملك كهرباثي |
| | | Lesso | n 3 | | |
| - Activi | ty 6 ¯ – — | | | | |
| Friction | احتكاك | Road | طريق | Approach | يلترب |
| Activi | ty 7 | | | | |
| Disappear | يختفي | Warming | التدفئة | Attention | نتباه |
| Electric bulb | مصباح كهربائي | Washing machin | ne غسالة | Mixer/Blender | غلاط |
| | | Lesso | n 4 | a Production All | |
| Activities 8, | 9, and 10 | | | | |
| Energy flow | مسار الطاقة | Noise | صْوصَاء | Cell phone (Mobile | e) لتليفون المحمول |
| Energy now | ALL PROPERTY OF A PARTY. | 17 / From htt 4 (17/11/94) 18/12/12/12 | | THE RESERVE THE PARTY OF THE PA | A BARNATT CARACTER |

Lesson 1

Activity 1 Can You Explain?

- >> We have learned that:
 - Energy can be changed from one form to another.
 - Most devices in our houses need electricity to operate.
 - Most of the energy we use everyday comes from the Sun.
 - Electrical energy can be generated from the Sun in different ways.
 - معظم الطاقة التي نستخدمها كل يوم تأتي من الشمس.
 - يمكن توليد الطاقة الكهربية من الشمس بطرق مختلفة.





- Solar cells can convert solar energy into electrical energy to operate many devices, such as solar-powered calculators.
- تقوم الخلايا الشمسية بتحويل الطاقة الشمسية إلى طاقة كهربية؛ لتشغيل العديد من الأجهزة مثل: الآلات الحاسبة التي تعمل بالطاقة الشمسية.

(ii)

Evaluate Your Learning!

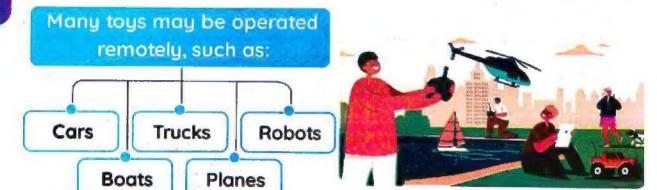
Put (1) or (X):

- Most of the energy we use everyday comes from the Sun. (
- Solar-powered calculators contain solar cells.

Activity 2 Energy in Remote-Controlled Cars

- >> Choose the correct answer:
 - Toy cars can be controlled ____ from a distance.(manually remotely)
 - Toy cars depend on _____ to be operated.

(food - batteries)



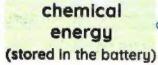
All of these toys need energy and use electricity to move and do tasks, such as turning in corners, moving their arms, or operating cameras.

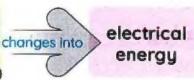
- تعمل العديد من الألعاب بالتحكُّم عن بُغد مثل: السيارات والشاحنات والطائرات والروبوتات.
- كل هذه الألعاب تحتاج إلى طاقة، وتُستخدم الكهرياء للتحرُّك والقيام بمهام مثل: الانعطاف وتحريك الأذرع أو تشغيل الكاميرات.

How do these toys get energy



- Toys need a source of energy, such as batteries to operate.
- Batteries store chemical energy inside them.
- When toys are operated;







or sound energy

- تحتاج الألعاب إلى مصدر للطاقة مثل البطاريات لتعمل.
 - تخزن البطاريات طاقة كيميائية بداخلها.
- عندما يتم تشغيل اللعبة، تتحوّل الطاقة الكيميائية إلى طاقة كهربائية، والتي يتم تحويلها إلى طاقة حركية أو صوتية.

What can we do when the battery of a device runs out



Batteries can be

- Recharged
- By plugging the device into the nearest charger.



Replaced With new ones from a store.

وعند نفاد شحن البطاريات بمكننا:

[2] استبدالها عن طريق شراء بطاريات جديدة من أحد المتاجر.

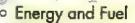
🗻 شحنها عن طريق توصيلها بأقرب مَقْبس.

Evaluate Your Learning!

>> Fill these gaps with the correct words:

(electrical - kinetic - sound - chemical - recharge - energy)

- can be changed from one form to another.
- When a toy car is operated, the _____ energy inside the battery changes into _____ energy, then into ____ energy or ____ energy.
- When the battery of your mobile phone runs out, you need to



Activity 3 Mars Rover



The distance between Earth and Mars is about



54 million kilometers.



A spacecraft takes six months or more to reach Mars.

- «المسافة بين الأرض والمريخ تبلغ حوالي ٥٤ مليون كيلومار.
- تستغرق المركبة الفضائية حوالي سنة أشهر أو أكثر؛ لتصل إلى كوكب للريخ.
- In the last few years, humans have sent many missions to Mars using robots and vehicles operated remotely and none of these missions included people.
- One of the most famous robots on Mars is the Curiosity Rover.
- · Like remote-controlled toys, these robots need a source of energy to be operated.

في الماضي، أرسى البشر العديد من البعثات إلى المريخ بواسطة الروبوتات والمركبات التي يتم تشغيلها عن بُغد، ولم تضم تلك البعثات

- من أشهر تلك الروبوتات على كوكب المريخ Curlosity Rover.
- وكالألعاب التي تعمل بالتحكم عن بُعْد، تحتاج تلك الروبوتات إلى مصدر للطاقة.

How does Curiosity Rover get energy



... Curiosity Rover uses:

Solar panels



Battaries that are charged with solar energy

How does the Curiosity Rover move and explore Mars





Solar panels on the Rover change solar energy into electrical energy to charge the Rover's batteries.



The batteries provide electrical energy to power the Rover's sensors, and this energy is converted into kinetic and thermal energies as the Rover moves and explores the surface of Mars.

Comparison between the toy car operated remotely and Mars Curiosity Rover

Remotely-operated Toy Cars

Similarities

- Both of them need a source of electrical energy to be operated.
- Both of them can be operated remotely (from a distance).

Difference:

- It depends on batteries to be operated.
- It depends on solar panels and long-lasting batteries to be operated.



The batteries used in toys cannot be used in Mars Curiosity Rover. Because Mars Curiosity Rover is too far from a store or charger plug on Earth.

Evaluate Your Learning!

Put (√) or (X):

- 1 Mars Curiosity vehicle needs electricity to move on Mar's surface.(
- 2 Curiosity Rover is used to explore the moon's surface.

Exercises on Lesson 1

| | | | | - |
|------------|------------------------------------|-----------------|------------------------|---------------------|
| Q1. | Choose the correct | t answer: | | |
| | The energy so | urce in a toy | car is the | (Cairo - Suez 2024 |
| | a engine | | | |
| | The energy sto | ored in a batte | ery ise | energy. (Cairo 2024 |
| | | | c. light | |
| | In the battery of | a toy car, | energy is co | nverted into |
| | energy. | | (Alex | 2023 - Gharbia 2024 |
| | thermal - electr | ical | b. chemical – e | electrical |
| | c. electrical – soun | ıd | d. chemical – l | ight |
| | Theen | ergy produced | from the battery | of a toy truck is |
| | changed into | | | |
| | a chemical - sour | nd | b. electrical – k | kinetic |
| | c. chemical – kinet | tic | d. kinetic – che | |
| | When a solar cal | | | energy is |
| | converted into | | | |
| | a electrical – light | | b. light - solar | |
| | c. sound – solar | | d. solar - elect | |
| | Curiosity Rover is | | | |
| | a. the Sun | | | |
| | The Curiosity Roy | | | |
| | | | c. kinetic | |
| | The of | | | |
| | | | | eries. (Alex. 2023) |
| | d. batteries – soun | | b. batteries – e | |
| | c. solar panels – so | ouna | d. solar panels | - electrical |
| Q2. | Put (√) or (X): | | | |
| | The Energy can be ch | langed from on | e form to anothe | |
| | | | | (Cairo 2023) (|
| | Solar energy can | be converted in | nto several types | of energy. () |

| Devices | and | Engrav | • |
|----------------|-----|--------|---|
| D6AIC62 | ana | CHAIGA | 1 |

| | The Mars Curiosity Rover converts solar energy into kinetic energy. | |
|---------|--|-----|
| | (Alex. 2024) (| 7 |
| | A toy car can continue moving even after its battery runs out. | |
| | (Giza - Dakahlia 2024) (|) |
| | Mars Curiosity can be operated from a distance. (| |
| | Mars is located a few meters away from Earth. (Alex. 2022) (|) |
| | All missions sent to explore Mars in the last years included people. | |
| | |) |
| | Curiosity Rover needs sound energy to be operated. | |
| 1 | |) |
| Q3. | Correct the underlined words: | |
| | Curiosity Rover is designed to explore the surface of the moon. (Giza 202 | 3) |
| | A supposed two security and a securi | .) |
| | It takes several years for a spacecraft to travel from Earth to Mars | |
| | surface. |) |
| | Solar energy is converted into kinetic energy that is used to recharg | e |
| | the batteries of Curiosity Rover. | - 1 |
| | The electrical energy produced from the battery of a toy car is | |
| | converted into sound energy that helps it to move. (|) |
| | Write the scientific term: | |
| T | It's a robotic vehicle that Is designed to explore the surface of Mars. | |
| | (| 5 |
| | (2) It's the form of energy that is produced from the battery and used to | - 1 |
| | | - 1 |
| | · · · · · · · · · · · · · · · · · · · | 1 |
| | It's the source of energy used to operate Curiosity Rover. (| |
| 05. | Complete the following sentences: | 1 |
| T | The idea of designing the Mars Rover depends on the idea of | |
| | transforming energy into energy. | |
| | The energy source in the toy car is the (Alex - Sharkia 202 | 41 |
| | | |
| | The input energy in a toy car is the energy stored in the battery. (Sharkia 202 | A) |
| | battery. (Sharkia 202 | ツ |

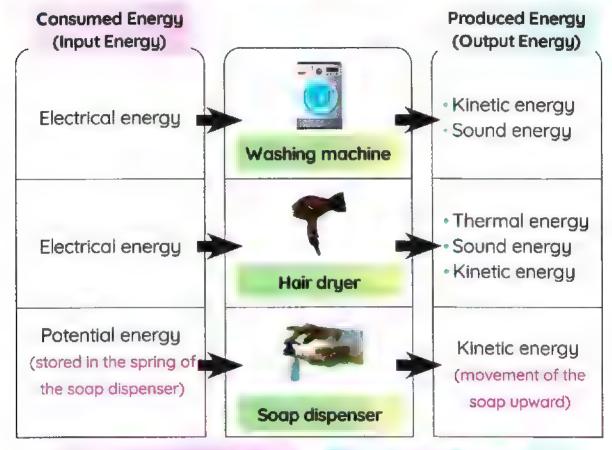
| 4 It takes several Mars surface. | for a spacecraft to travel from Earth to |
|--|---|
| 5 Some calculators | depend on cells that use the solar |
| energy coming fro | om the to be operated. |
| Choose from colum | in (A) what suits it in column (B): |
| či 💍 Column (A) | Column (B) |
| 1 Kinetic energy | a. is designed to explore the surface of Mars |
| 2 Chemical energy | b. is a form of energy produced when a toy car starts to move. |
| 2 Curiocitu Boyon | c. is a form of energy stored in the battery a |
| Curiosity Rover | toy car. |
| 7 | toy car. |
| Give reasons for: 1 The toy car has a limit to the control of the | toy car. (Ca`ro 202) Yer operates for a long period of time on Mars |

| 3. | What happens if: | | |
|----|---|---|--------|
| | The battery of a drone runs out? | .,.,. | •·· p |
| | © Sunlight falls on the solar panels of Mars Curiosity Rover (Kafr El-She | | |
| | A solar calculator isn't exposed to sunlight? | 100 100 100 100 100 100 100 100 100 100 | |
| | ************************************** | province of the (de | 144144 |
| | Study the following figures, then put (/) or (X): | | |
| • | | MATTERY | |
| • | Figure 1 Figure 2 Figure 3 Figure | | |
| • | Figure 1 Figure 2 Figure 3 Figure 1 The batteries of the robot in figure 2 can be recharged by | | |
| | Figure 1 Figure 2 Figure 3 Figure | y (| |
| | Figure 1 Figure 2 Figure 3 Figure 4 The batteries of the robot in figure 2 can be recharged by electrical energy produced from the solar panels. | y (| |
| | Figure 1 Figure 2 Figure 3 Figure 4 The batteries of the robot in figure 2 can be recharged by electrical energy produced from the solar panels. When the battery of the device in figure 1 runs out of charges. | y (arge (| |
| | Figure 1 Figure 2 Figure 3 Figure 3 The batteries of the robot in figure 2 can be recharged by electrical energy produced from the solar panels. When the battery of the device in figure 1 runs out of chayou must recharge it to be operated. The robot in figure 2 depends on the batteries in figure 4 operated. The toy car in figure 3 depends on the batteries in figure 4 | y arge () to I | 0 |
| | Figure 1 Figure 2 Figure 3 Figure 4 The batteries of the robot in figure 2 can be recharged by electrical energy produced from the solar panels. When the battery of the device in figure 1 runs out of chayou must recharge if to be operated. The robot in figure 2 depends on the batteries in figure 4 operated. | y (arge (a) to I | 0 |

Lesson 2

Activity 4 What Do You Already Know About Devices and Energy?

- >> People depend on machines and devices to make their lives easier.
- >> Let's explore how devices use energy to work.



Input Energy

It is the energy consumed in the device.

It is the energy

procli et fra the device.

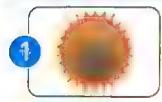
Evaluate Your Learning!

- >>> Put (/) or (* /):
 - Sound energy is consumed on operating the radio.
 - When you rub your hands, kinetic energy is converted into thermal energy.
 ()

Activity 5 Energy Chains

- >> The Sun is considered the main source of energy for all the devices we use.
- >> Energy chains show the flow of energy from the Sun to different devices.
 - تُعتبر الشمس هي المصدر الرئيسي للطاقة لجميع الأحهزة التي نستخدمها.
 - تساعدنا سلاسل الطاقة على معرفة مسار الطاقة من الشمس وصولًا للأجهزة المختلفة.

1 Energy chain when eating food, such as an orange:



The Sun emits light energy that reaches the orange tree.



The green plant converts the light energy of the Sun into chemical energy, which is stored in the form of sugar inside the orange tree.



When you eat an orange, your body converts the chemical energy in the orange into kinetic energy as you move.

- 📘 تشع الشمس طاقة ضرئية والتي تصل إلى شجرة البرتقال.
- 2 يُحوِّل النبت الطاقة الضوئية من الشمس إلى طاقة كيميائية مختزنة في صورة مواد سكرية.
- 3 عند تناول البرتقال، يقوم جسمك بتحويل الطاقة الكيميائية المخزنة في البرتقال إلى طاقة حركية عندما تتحرك.



is converted into

chemical energy (stored inside the plant then inside your body)

is converted into

kinetic energy. (to do different activities



During running, there is a change of energy inside your body.

Because the chemical energy stored in food is converted into kinetic energy, which enables your body to move.



2 Energy chain when heating a pot of water over a fire:

>> Light energy that comes from the Sun causes the growth of trees.





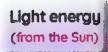
>> Inside the tree, light energy is converted into chemical energy, which is stored inside the tree in the form of sugar.





>> When the wood of trees is burned, thermal energy is released, which heats the water inside the pot.

- 🚹 يُمِين الطاقة الضوئية الصادرة من الشمس على نمو الأشجار.
- 🔼 تتحوُّل الطاقة الضوئية من الشمس إلى طاقة كيميائية مختزنة في صورة مواد سكرية داخل الأشجار.
 - [3] عند حرق قطع من أخشاب الأشجار، تُنتَج طاقة حرارية تُستخدم لتسخين الماء في الإناء.



is converted

chemical energy (stored inside the tree) is converted

thermal energy. (when burning the wood of trees to heat water inside the pot)

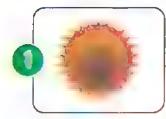


There is a change of energy when burning wood.

Because the chemical energy stored inside the wood of trees is converted into thermal energy.



Energy chain in a hair dryer:



Light energy that comes from the Sun causes the growth of trees.



- >> Coal is produced from the remains of dead trees buried deeply in the Earth over millions of years.
- Coal is a source of energy that stores chemical energu.

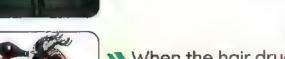


in the electric power station:

- Coal is burned to produce thermal energy.
- Thermal energy is converted into kinetic energy.
- A certain device changes kinetic energy into electrical energu.



>> The electrical energy reaches the hair dryer through electric copper wires.



- - >> When the hair druer is operated, electrical energy changes into:
 - Thermal energy.
 Kinetic energy.
 Sound energy.
 - 🚺 تعمل الطاقة الضوئية الصادرة من الشمس على نمو الأشحار.
 - 2] يتكوَّن الفحم من بقايا الأشجار الليتة من ملايين السنين. يُعتبر الفحم من مصاس الطاقة التي تختزن بداخلها الطاقة الكيميائية.
 - ③ ق محطة تونيد الكهرياء:
 - يتم حرق القحم وتتولد طاقة حرارية تتحوّل الطاقة الحرارية لطائة حركية. يقوم جهاز معين بتحويل الطاقة الحركية إلى طاقة كهربية.
 - 4] تصل الطاقة الكهربية إلى مجفف الشعر عبر أسلاك تُصنع من النّحاس.
 - [5] عند تشغيل مجفف الشعر، تتحوَّل الطاقة الكهربية إلى: طاقة حرارية وطاقة حركية وطاقة صوتية.

The following diagram shows the energy path from the Sun to the hair dryer:

Light energy (from the Sun)

is converted

chemical energy (stored inside coal)

is converted

thermal energy (when burning the coal inside a power plant)



 Thermal energy • Sound energy • Kinetic energy (in the hair druer)

is converted

electrical energu (goes through the electric wires)

Energy Chain

It is a way to describe the energy flow that occurs when we use different devices. سلسلة الطاقة: هي طريقة تُوضُّح كيفية انتقال الطاقة عند استخدام الأجهزة المختلفة.

NOTES

- Energy chains often starts with the Sun.
- · Not all the energy in the energy chain reaches the device because some of the energy is wasted and converted into other forms that the device doesn't use.
- Most of the lost energy leaks out in the form of heat.
- Energy can't be destroyed inside devices, but it is transformed into other forms of energy.
 - غالبًا تبدأ كل سلاسل الطاقة بالشمس.
- ولا تصل كل الطاقة التي دخلت سلسلة الطاقة إلى الجهاز حيث تهدر بعض الطاقة وتتحوَّل لصور أخرى لا تُستخدم بواسطة الجهاز.
 - معظم الطاقة المفقوية تتسرُّب على شكل حرارة.
 - الطاقة لا يمكن أن تُدمر داخل الأجهزة، ولكنها تتحوُّل إلى صور أخرى من الطاقة.

Exercises on Lesson 2

| Choose the co | orrect answer: | | |
|--------------------------------|-----------------------|----------------------|-----------------------------------|
| The input er | nergy when using t | he hair dryer is | energy. |
| a. potential | b. electrical | c. kinetic | d. light |
| | | · (C | airo 2023 - Giza 2024 |
| When coal | is burned, | energy is prod | uced. (Sharkia 2024 |
| a. kinetic | b. electrical | c. thermal | d. chemical |
| The wasted | energy in most o | devices is in the fo | orm of |
| energy. | | | (Menfouia 2023 |
| a. electrical | b. thermal | c. sound | d. kinetic |
| In the wash | ing machine, | energy is co | onverted into |
| kinetic and | sound energy. | | (Giza 2023 |
| a. thermal | b. light | c. electrical | d. potential |
| The output of | energy when using | the hair dryer is | energy. |
| | | | (Giza 2023 |
| a. potential | b. electrical | c. light | d. thermal |
| The input en | ergy in the fridge is | senergy. | (Alex. 2024) |
| a. electrical | b. sound | c. chemical | d. thermal |
| Electric wires | s are made of | | |
| plastic | b. wood | c. iron | d. copper |
| All the follow | ing are forms of er | nergy that are prod | luced from th <mark>e hair</mark> |
| dryer, except | tenergy. | | |
| a. sound | b. thermal | c. electrical | d. kinetic |
| When you ed | at an apple, your b | ody converts the | energy |
| stored in the | apple into | energy when you | move. (Gharbia 2024) |
| a. chemical – e | electrical | b. kinetic – che | mical |
| c. electrical – c | chemical | d. chemical – k | inetic |
| W You feel warr | m when you rub yo | our hands together | because |
| energy is cor | nverted into thermo | al energy. | (Cairo 2023) |
| a. kinetic | b. sound | c. electrical | d. light |

| Q2. | Put (√) or (X): | | |
|-----|--|--|----------|
| | 1 Most energy chains start with the moon. (Gi | zo 2023 - 2024) (|) |
| | The energy chain of a burning candle consists of a | chemical energy | |
| | that is converted into thermal energy and light ene | ergy. | |
| | | (Giza 2022) (|) |
| | (3) There is stored chemical energy inside the food we | e eat. | |
| | | (Giza 2023) (|) |
| | Energy can't be transformed from one form to and | other. | |
| | | (Alex. 2024) (|) |
| | 5 Coal is produced from the remains of dead trees b | ouried deeply in | |
| | the Earth over millions of years. | (|) |
| | 6 Energy may be destroyed inside different devices. | | |
| | (Cairo 2023 - | Damietta 2024) (|) |
| | All the energy that enters the energy chain reache | s the device | |
| | completely. | (|) |
| | 8. On pressing the spring of the soap dispenser, pote | ntial energy is | |
| | converted into kinetic energy. | (|) |
| | 9 When coal is burned, it produces heat energy. | (Cairo 2024) (|) |
| Q3. | Write the scientific term: | | |
| | 1 It is the main source of most forms of energy on E | arth's surface. | |
| | (Alex. 2024 | | _) |
| | 2) It is the energy produced when the wood of trees i | s burned. | |
| | (Alex. 2022 | 2) (|) |
| | (3) It is the form of energy that is stored in the battery | of a remote | |
| | control. | C sections and crafters and preferences the present the section of | _) |
| | It is the energy stored in plants in the form of sugar | F. (): |) |
| | 5. It is the energy consumed to operate the blender. | (|) |
| | 6 It is a path that shows the energy flow from its sou | rce to the device | <u>.</u> |
| | | (| _) |

| _ | |
|-----|--|
| Q4. | Complete the following sentences: |
| 7 | In many energy chains, some of the energy is wasted or lost in the form of |
| | The energies that are produced from the washing machine are |
| | energy and energy. |
| | When you press the soap dispenser, energy is converted |
| | Into kinetic energy. During running, your body converts the energy stored in |
| | |
| | food into energy. is produced from the remains of dead trees buried in Earth |
| | over millions of years. |
| | Both coal and food store energy. |
| | 14390 |
| Q5. | Complete the energy chain in the hair dryer: (Cairo 2023 |
| (1 | energy is converted energy is converted thermal energy, there kinetic energy (stored inside coal) into |
| | into |
| | is converted into into is converted into into |
| Q6. | Give reasons for: |
| | The Sun is considered the main source of energy for all devices. |
| | Not all the energy that enters the energy chain reaches the device |
| | There is a change of energy when burning a piece of wood. |

| During running, there is a chang | ge of energy that happens in your body |
|--------------------------------------|--|
| What happens if: | AND AND THE PROPERTY OF THE PR |
| Nou burn a piece of wood? | (According the change of energy |
| | (Dakahi'a 2024 |
| You rub your hands together? | (According to the change of energy |
| | (Menoufia 2022 |
| Tou turn on the television? | (According to the change of energy |
| | (Com 2023 |
| You press the spring of the soa | p dispenser? |
| | (According to the change of energy) |
| Observe the following devices below: | , then complete the sentences |
| | |
| | |
| | dce 2 Device 3 |
| | energy and energy. |

Lesson 3

Activity 6 Energy and Everyday Devices

- Any device needs a source of energy to be operated.
- >> Energy can be changed from one form to another.

يمكننا تحويل الطاقة من صورة الأخرى.

بحثاج أيُّ جهاز إلى مصدر للطاقة لتشغيله.

The following table shows the energy changes inside some devices:

| Device | [Wider | Input Energy Consoned Energy | |
|-------------------|----------------------------------|---------------------------------|--------------------------------|
| 1 Electric bulb | Lighting | Electrical energy | Light energy Thermal energy |
| 2 TV | Displaying sound and image | Electrical energy | Light energy Sound energy |
| 3 Electric iron | Ironing clothes | Electrical energy | Thermal energy |
| 4 Electric heater | Warming | Electrical energy | Thermal energy |
| 5 Door bell | | Electrical energy | Sound energy |
| 6 Hand bell | Alerting | Kinetic energy | Sound energy |

Energy and Fuel

| Device | Function | | |
|------------------------------|---------------|---|----------------|
| 7 Guitar | Playing music | Kinetic energy | Sound energy |
| 8 Spring- powered toy car | | Potential energy (stored in a spring) | Kinetic energy |
| Battery- powered toy car | Toys for kids | Chemical energy (stored in a battery) | Kinetic energy |
| 10 Watch | Knowing time | Chemical energy (stored in a battery) | Kinetic energy |

- The energy that goes in the device is called "input energy".
- The energy that comes out of the device is called "output energy".
- Some of the input energy leaks out as other forms of energy that the devices do not use to perform their functions.

أسمى الطاقة التي تدخل الجهاز بمدخلات الطاقة.

تُسمى الطاقة الصادرة من الجهاز بمخرجات الطاقة.

و نتسرَّب بعض مدخلات الطاقة داخل الأجهزة لصُور أخرى قد لا تستخدمها الأجهزة لأداء وظائفها.



Evaluate Your Learning!

>> Mention the input and output energies for these devices:

| Device | Firmer | Park in the last of the last o | Control Mengy |
|-------------------------|--------|--|--|
| 1 Radio | | *************************************** | ************************************** |
| 2 Electric fan | | The second secon | пе по продиранция на принада МАН (О ППППППППППППППППППППППППППППППППППП |
| 3 Blender | | | senson per pe pi milati. Dani -ti -ti - i -i - |
| 4 Flashlight | | make a de alle de de la company de la compan | 30-yila ad juqladalaring da 180 to 187 to |
| 5 Electric water kettle | | former lighting statements maken in an abbilided | professional designation and and the State |
| 6 Drum | | | Todala make 12 of the material property processing and address and |

Activity 7 The Conservation of Energy

- In the previous lesson, we learned that energy can be easily transformed from one form to another.
- Now, let's study some examples of energy transformation.

Energy Chain While Riding a Bike



When you eat your breakfast,

the chemical energy stored in the food provides your body with energy.



When you push the pedals of the bike. chemical energy is converted into kinetic energy, which causes the bike to move.





Some of the kinetic energy is converted into thermal energy due to the friction between the tires of the bike and the road.

We can summarize this energy chain in the following diagram as follows:





kinetic (mechanical) energu (during the bike's movement)



thermal energy. (due to friction with the road)

Energy Chain in the Light Bulb

When you turn on a light bulb:

Electrical energy (passing through the electrical wires)



light energy and thermal energy. (in the light bulb)

You feel warm (heat) when you put your hand near a light bulb. 🚮



Because some of the electrical energy is converted into thermal energy, so you can feel the heat of the bulb

--- From the previous example, we conclude that:

- >> The new energy cannot be created from nothing.
- >> The old energy does not disappear, but it changes into another form.
- >> This is called "The Law of Conservation of Energy".

الطاقة القديمة لم تختف، لكنها تتغيَّر من صورة لأخرى.

لا يمكن أن تُخْلُق الطاقة الجديدة من العدم (لا شيء).

Law of Conservation of Energy

Energy is neither created nor destroyed but it is only converted from one form of energy to another.

قانون بقاء الطاقة: الطاقة لا تُفْنَى أو تُستحدث من العدم، ولكن يمكن تحويلها من صورة لأخرى.

Evaluate Your Learning!

- >>> Put (
) or (
 - Thermal energy doesn't help the light bulb to do its main job.
 - Friction always produces thermal energy.

Exercises on Lesson 3

Q1. Choose the correct answer:

| The energy p | roduced from th | ne electric bulb is | energy. |
|--|--|--|--|
| | | | (Behiera 2023) |
| a. light | b. electrical | c. sound | d. kinetic |
| The output en | ergy when playin | g drums is the | energy, |
| | | | (Minia 2023) |
| a. chemical | b. sound | c. potential | d. light |
| The | produces therma | l energy only. | |
| a. washing mad | :hine | b. blender | |
| c. light bulb | | d. electric iron | |
| The input energy | gy when using the | e lamp is the | energy. (Min'a 2023) |
| a. electrical | b. potential | c. kinetic | d. thermal |
| (5) When you turn | n on a flashlight, tl | he chemical energ | gy stored in the |
| battery is conv | /erted into | energy that is | converted into |
| ener | gy. | | |
| a. light – sound | | b. electrical – I | ight |
| c. kinetic – elect | rical | d. light - electr | rical |
| When you use | a.hand bell, | energy is co | onverted into sound |
| energy. | | | (Alex. 2024) |
| | | | [Alex. 2024] |
| a. light | b. thermal | c. kinetic | · · |
| ener ener | | c. kinetic produced when y | d. electrical |
| 436 | gy is not used or | produced when y | d. electrical ou turn on the |
| television. a. Light | gy is not used or b. Electrical | produced when y | d. electricalou turn on thed. Chemical |
| television. a. Light | gy is not used or b. Electrical | produced when y | d. electrical ou turn on the d. Chemical |
| television. a. Light Both the hair of | gy is not used or b. Electrical | c. Sound water kettle produ | d. electricalou turn on thed. Chemical |
| television. a. Light Both the hair of energy. a. electrical | b. Electrical lryer and electric b. potential | c. Sound water kettle produce. | d. electrical ou turn on the d. Chemical uce (Dakahlia 2024) d. chemical |
| television. a. Light Both the hair of energy. a. electrical Some kinetic e | b. Electrical lryer and electric b. potential | c. Sound water kettle produced c. thermal | d. electrical ou turn on the d. Chemical uce (Dakahlia 2024) d. chemical |
| television. a. Light Both the hair of energy. a. electrical Some kinetic e | b. Electrical lryer and electric b. potential energy is converte | c. Sound water kettle produced c. thermal ed intoe | d. electrical ou turn on the d. Chemical uce (Dakahlia 2024) d. chemical nergy due to the |

| 1 | | | | | |
|------------|-----------------------------------|----------------------|---|----------------------|--------|
| | 10 The output ener | rgy when playing | a guitar is | energy. | |
| | | | (Alex | x. 2022 - Red Sea 20 | 24 |
| | chemical | b. sound | c. potential | d. light | |
| | (is the | energy produced | from the electri | ic lamp and it | |
| | affects our eyes | 5. | | | |
| | a. Light energy | | b. Thermal en | ergy | |
| | c. Chemical energ | gy | d. Sound ener | gy | |
| Q 2 | Put (/) or (X): | | | | |
| | Both the electric | bulb and electric | heater produce | e thermal energy. | |
| | | | | (Alex. 2022) (|) |
| | ② One of the outpu | ut energies in the | piano is chemic | al energy. | |
| | | | | (Menoufia 2024) (|) |
| | When you turn of | on the light bulb, i | t produces light | energy only. (|) |
| | Thermal energy | is not used or pre | oduced when yo | ou turn on the hair | ٢ |
| | dryer. | | | (|) |
| | The output energ | gy in an electric he | ater is sound ene | ergy.(Cairo 2024) (|) |
| | & Energy can neith | her be created no | r destroyed; it co | an only converted | k |
| | from one form to | o another. | | (Red Sea 2024) (|) |
| | When pedaling a | a bike, the chemic | al energy in you | ur body changes | |
| | into kinetic energ | gy. | | (Minia 2022) (|) |
| | There is stored c | chemical energy i | nside the food w | re eat. | |
| | | | | (Giza 2023) (|) |
| 23. | Write the scientifi | ic term: | | | |
| T | (1) It is a device use | d to convert elect | rical energy into | light energy. | |
| | | | (Alex. 202: | 2) (| _) |
| | 2 It is the energy p | produced when yo | ou turn on the ek | ectric heater. | |
| | | | | (1945 |) |
| | It is the energy us | sed to play the di | ʹυm. | | |
| | | (Minia | 2023 - Behira 2024 | 4) (| _) |
| | A It is the energy p | roduced from pla | ying the guitar. | | |
| | | | (Giza 2023 | 3) (|) |
| | | (Minia | 2023 - Behira 2024 Iying the guitar. | 4) (| şaşdyd |

| | ergy and Fuel |
|-----|--|
| | It is the energy used to operate the radio. |
| | It is the energy that is always produced due to friction. |
| | The Energy can't neither be created nor destroyed; it can only be |
| | changed from one form Into another. (Dakahlia 2023) () |
| Q4. | Complete the following sentences using the words |
| | brackets: |
| | (electrical - kinetic - wires - light - sound - converted) |
| | When you turn on the television, electrical energy travels through the until it reaches the television. (Beh'ra 2022 |
| | 2 The energy can be from one form to another. (Cairo 2023 |
| | The electric lamp converts energy into and |
| | thermal energy. |
| | When you shake a hand bell, energy is produced. |
| Q5. | Complete the following sentences: |
| | The electric lamp converts energy into light energy. |
| | [Alex.2022 - 2024 |
| | 2 In the electric heater, energy is considered an input energy while thermal energy is considered an energy. |
| | |
| | To operate an electric mixer, we useenergy. (Cairo 2024 |
| | Energy can neither be; it can only be |
| | from one form to another. (Cairo 2023) |
| | Some of the kinetic energy is converted into energy due to the friction of the bike's tires with the road. |
| Q6. | Cross out the odd word: |
| | Food - Battery - Lamp - Coal (Cairo 2024) (|
| | 2 TV - Hand mixer - Fridge - Washing machine |
| | |

Q7. Give reasons for: You feel warm when you put your hands near a lighted electric bulb.

- There is a change of energy when you turn on the radio.
- A flashlight needs batteries to be operated.

Q8. What happens if:

Tou put your hand near a lighted lamp? (Minia 2023 - Cairo 2024)

You turn on an electric lamp? (According to the change in energy)
(Cairo 2023)

You shake a bell with your hand? (According to the change of energy)
(Cairo 2023)

You operate an electric kettle that contains some water?

Q9. Observe the following figures, then complete the sentences below:









Figure 1

Figure 2

Figure 6

Figure 4

- The device in figure (.....) produces thermal energy only.
- The device in figure (.....) doesn't need electrical energy to be operated.
- The device in figure (.....) produces thermal energy and light energy.
- The device in figure thanges energy into energy.



Activity 8 Follow the Flow

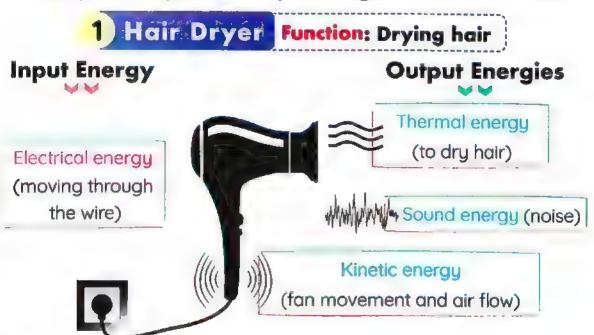
>> Put (/) or (x):

- Thermal energy helps the electric bulb do its function.
- (2) Kinetic energy helps the blender do its main job. ()

According to the Conservation Law of Energy:

- Energy is conserved, so it can't be created nor destroyed.
- All the energy that enters a device must eventually come out of it, either in the same form or in other forms of energy.

Examples of input and output energies in some devices:





The noise produced by the hair dryer is considered wasted energy.

Because the sound energy produced from the hair dryer doesn't help it do its main function.

2 Mobile Phone

Functions: Lighting up, ringing and processing information



Input Energy





Output Energies

Electrical energy

(when charging the phone)

Electrical energy is stored in the battery in the form of chemical energy.

Light energy and sound energy



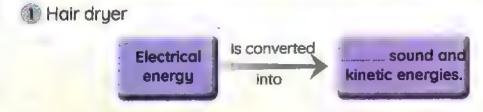
The mobile phone becomes warm on using it for a long period of time.

Because some of the electrical energy is wasted in the form of heat.

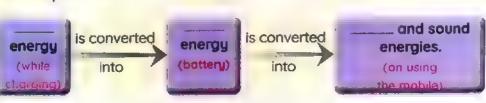


Evaluate Your Learning!

>>> Complete the following chains that describe the change of energy inside:



Mobile phone



>> Complete the following energy chains to show the change of energy on operating the following devices:



is converted energy into (from the Sun).

is converted (stored in coal) into

thermal and kinetic energies

(in electric power stations) are converted into

energy (helps the wasting machine to do its function) energy (as wasted energy)

energy

(flows through the wires)

is converted into

phone

energy (from the Sun)

is converted into

energy (stored in coal)

is converted Into

thermal and kinetic energies

(in electric power stations) are converted into

and ____ energies (help the mobile phone to do its function) energy.

(wasted energy)

energy

(flows through the wires)

is stored in the battery in the form of

energy

is converted into

Record Evidence Like a Scientist: **Energy in Remote-Controlled Cars**

>> You have learned a lot about energy transformations and how different devices get the energy that they need to operate.

| Question: |
|--|
| How can you describe the energy in a remote-controlled car now? |
| |
| My Claim: |
| The Court of the C |
| |
| The contraction of the contracti |
| man is straight to make a the straight and a straig |
| |
| Evidence: |
| Is the state of th |
| |
| |
| |
| |
| Scientific Explanation with Reasoning: |
| |

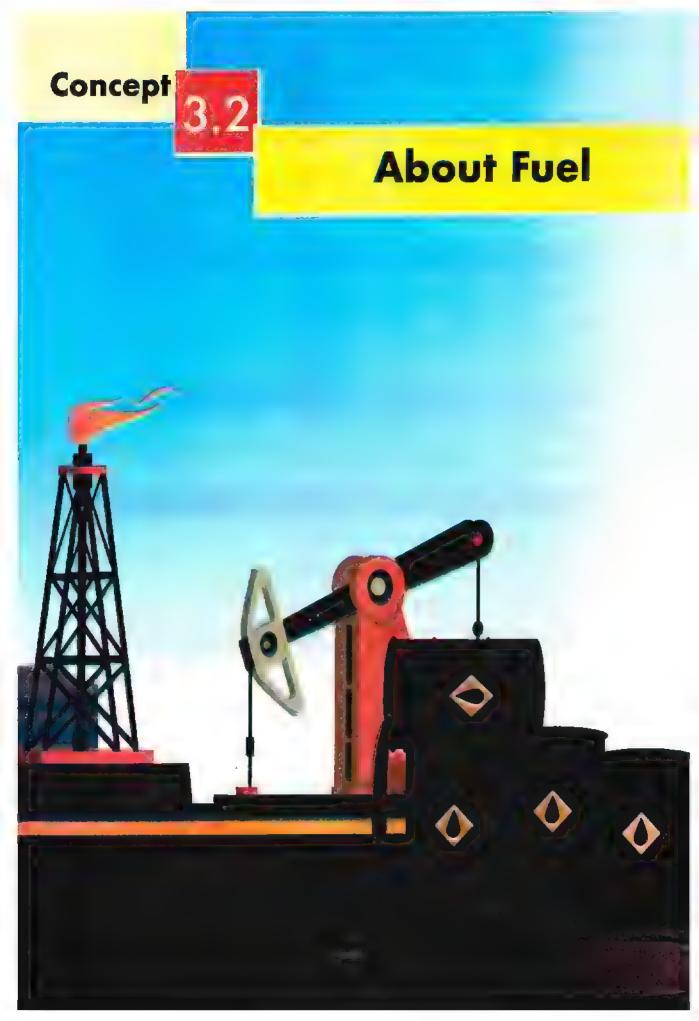
Exercises on Lesson 4

Q1. Choose the correct answer:

| The stored e | nergy inside the bo | attery of a mobile | phone is | |
|--|----------------------|-----------------------------------|------------------------------------|--|
| energy. | | | (Alex. 2023) | |
| electrical | b. light | c. chemical | d, sound | |
| ² The energy t | hat is wasted durin | ng operating the h | nair dryer is the | |
| where we have not have not some such three sets the set $\frac{d}{dt}$ | | | (Alex. 2024) | |
| a. sound energ | gy | b. chemical e | nergy | |
| c, thermal ene | rgy | d. light energy | | |
| The energy t | hat isn't used or pr | oduced while usir | ng a mobile <mark>phone i</mark> s | |
| on cases can be as a concentral and de . | | | | |
| a. chemical en | ergy | b. light energi | y | |
| c. sound energ | gy | d. potential er | nergy | |
| 4 In a light bulk | o, the ene | rgy is considered | a wasted energy. | |
| | | | (Kafr El-Sheikh 2024) | |
| a, electrical | b. chemical | c. thermal | d. light | |
| 5 Thermal ene | rgy is not consider | ed lost energy in | the | |
| a. mobile phone b. washing machine | | | | |
| c. electric fan d. electric heater | | | iter | |
| 6 The produce | d energy from the | radio that reflects | s its main function is | |
| en | ergy. | | (Cairo 2023) | |
| a. electric | b, sound | c. light | d. chemical | |
| 7. As energy tro | ansforms from one | form to another, | some of it is often | |
| lost as | nomondravirius (f) | | {Fayoum 2024} | |
| a. light | b. heat | c. sound | d. movement | |
| (8) Which energy | y chain shows the | change of energy | that occurs while | |
| using the mo | bile phone? | | | |
| a. Electrical en | ergy 🕳 Light ener | rgy 🛶 Sound ene | ergy | |
| b. Electrical en | ergy 🛶 Chemical | energy - Sound | d and light energies | |
| | ergy 🛶 Kinetic en | | _ | |
| | | | c and light energies | |
| | | | 9 | |

| | 9 | The electrical energy that enters the television comes out of it in the form of | |
|-----|----|--|----|
| | | i. light energy only b. kinetic energy | |
| | | sound energy only d. light and sound energies | |
| | | | |
| 7 | | If (√) or (X): The sound energy produced from a hair dryer helps it do its main | |
| | • | function. (Red Sea 2024) (|) |
| | 2 | Therma energy is considered wasted energy on using the compute | r. |
| | _ | (|) |
| | 3 | The produced kinetic energy helps the blender do its function. (| |
| | | When you run, the chemical energy inside your body is transformed | |
| | | into kinetic energy. (| ار |
| | 5 | The amount of electrical energy used to charge a mobile phone is | |
| | | greater than the light energy it produces. (|) |
| | 6 | All the energy that enters the device comes out of it in the form of | |
| | | heat. |) |
| Q3. | W | rite the scientific term: | |
| T | | It is the energy that is produced from the blender and helps it in | |
| | | doing its job. | |
| | 2 | It is a kind of energy that is produced from the electrical heater and | |
| | | burning coal. (Alex. 2023) (| 기 |
| | 3 | It is the wasted energy when using a mobile phone for a long time. | |
| | | (Dakahlia 2024) (| 기 |
| | 4 | It is the unusable energy that is produced from the electric lamp. | |
| | | Commission for the state of the |) |
| 24. | Co | mplete the following sentences: | |
| | 1 | A mobile phone converts the chemical energy stored in its batteries | |
| | | into and energies. (Qalyoubia 2023 | 3} |
| | 2 | The energy produced from the radio which helps the device do its | |
| | | main function is energy. (Behira 2023 | 1) |
| | 3 | energy is the input energy in the hair dryer. | |





Concept 2

About Fuel

| - Lugarian Commence | Lesson I |
|--|---|
| Activity 1 | Can You Explain? |
| Activity 2 | Fuel and Road Trips |
| Activity 3 | What Do You Already Know About Fuel? |
| A STATE OF THE STA | Lesson 2 |
| Activity 4 | Types of Fuel |
| Activity 5 | Oil and Water |
| The first of the second second | Lesson 3 |
| Activity 6 | Fossil Fuel Formation |
| Activity 7 | Living Without Electricity |
| Activity 8 | Using Fossil Fuel to Generate Electricity |
| | Lesson 4 |
| Activity 9 | Big City Environmental Concerns |
| Activity 10 | Burning Fossil Fuel and Pollution |
| Activity 11 | Conserving Fossil Fuel |
| The state of the s | -Łesson 5 |
| Activity 12 | Using Fuel |
| Activity 13 | Record Evidence Like a Scientist |

Glossary

| Lesson (1) | | | | | |
|---|--|-----------------|------------------|---------------|---|
| L ACTIVITY | iu. | | | - 4 | · 2 *********************************** |
| OII | زيت | Coal | فجم | Natural gas | غاز طبيعي |
| Fossil fue | الوقود الحقري | Extract | يستخلص | Underground | باطن الأرض |
| Antivit | | | | | |
| Pointer | مؤشر | Operate | يشغل | | |
| Activit | VIII TO THE REAL PROPERTY OF THE PERTY OF TH | | | | |
| Means of transpo | ortation وسائل النقل | | | | |
| | | Lesson | (2) | | |
| Achvit | y 4 | | | | |
| Run out | ينعز | Release | تنتج | Biofuel | انوقون الميوي |
| Planted | مزروع | Renéwable | مقجاران | Corn | الذرة |
| Wood chips | رقائق الخشب | Ancient | قديم | Charcoal | فحم نباتي |
| Conservation | ولقر | Rocks | منخون | Deforestation | إزالة الغابات |
| Negative Impact | تأثير سلبي | Remains | يقايا | Sediments | رواسب |
| Pressure | شقط | Conserve | يحفظ | Settle on | تستقر علي |
| Replace | يستبدل | Sea creatures | كاننات بحرية | Cover | يغطي |
| Activity | | | | | |
| Convert | يحول | Available | متاح | | |
| Lesson (3) | | | | | |
| ACTAVISON L. | | | . , | • | |
| Steam | بخار | Regions | المناطق | Candle | شمعة |
| Turbines | التوربينات | Generators spin | تدور المولدات | Appliances | الأجهزة |
| | | Lesson | | | |
| المَّا وَالْمُوالِينَ الْمُنْ | u an h | | | | · · |
| Trap | يحبس | Industry | مناعة | Agriculture | الزراعة |
| Smog | الضياب الدخاني | Pesticides | مبيدات حشرية | Irritation | تهيج |
| Breathe | پتنفس ، | Lungs | الرئتان | Damage | يدمر |
| Acid rain | الأمطار الحمضية | Global warming | الاحترار العالمي | Combine | يتحد |
| Atmosphere | الغلاف الجري | | | | |

Lesson 1

Can You Explain?

Humans depend on fuel as an important resource of energy in their daily lives, such as:



move.





We can define "fuel" as follows:

Fuel

It is a substance that produces thermal energy when it is burned. الوقود: هو مادة تُنْتَج طاقة حرارية عند حرقها.

- The gasoline found in gas stations comes from oil.
- Oil, coal, and natural gas are extracted from the underground.
 - ° الحازولين للوجود في محطات الوقود مشتق من النفط.
 - * يُستخرج النفط والفحم والغاز الطبيعي من باطن الأرض.

Fuel is burned in electric power stations to nerate electricity

° يحترق الوقود في محطات الطاقة لتوليد الكهرباء.



Activity 2 > Fuel and Road Trips

>>> Choose the correct answer:

Cars need _____ to move.

(food - fuel)

As the speed of the car increases, the amount of used fuel

(decreases - increases)

If a car runs out of fuel, it will stop moving.



On going on a long trip by car, we must check the gasoline pointer,



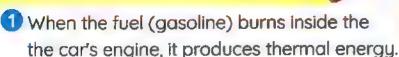
 عند الذهاب في رحلات طويلة باستخدام السيارة، يجب أن تتحقّق من مؤشر الوقود،

If the gasoline pointer (fuel indicator) becomes close to zero, you must fill the fuel tank from the nearest gas station to continue driving the car.



 إذا أصبح مؤشر الجازولين يقترب من الصفر، فعليك أن تملأ خزان الوقود من أقرب معطة وقود.

Why does the car need fuel to move



The car's engine rotates the wheels of the car.

(Kinetic energy)

يحترق الوقود في محرك السيارة، فيتمكّن المحرك من تدوير عجلات السيارة.









kinetic energy. (causing the engine to rotate the car's wheels)

Science Prim. 4 - Second Term 0.47

(0)

Any fuel stores chemical energy, which is converted into thermal energy when it is burned.

Uses of Some Forms of Fuel

We use different forms of fuel to get energy for different purposes, such as:



Gasoline or natural gas

are used in operating all means of transportation.

Oil, natural gas, or coal are used in generating electricity.





Coal or wood are used in warming houses.

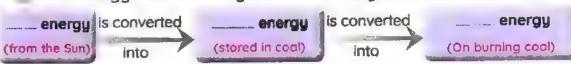
Coal, natural gas, or wood are used in cooking food.



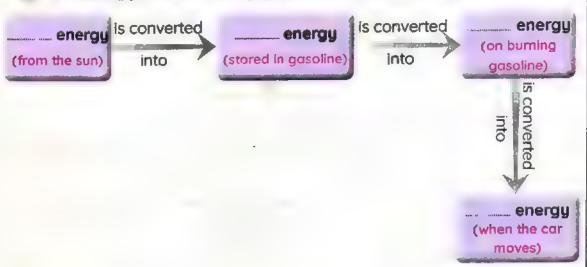


>>> Complete the following energy chains:

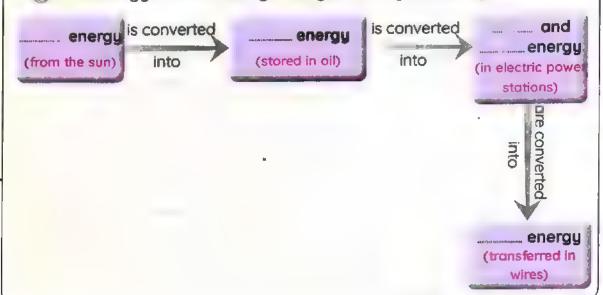
The energy chain of using coal in warming houses or cooking food:



The energy chain of using gasoline in operating cars:



The energy chain of using oil in generating electricity:



Exercises on Lesson 1

Q1. Choose the correct answer:

| 1 All the follo | owing are forms of fue | el, except | (Suez 202 |
|--|---------------------------|-----------------------------------|--|
| a. coal | b. gasoline | c. natural gas | d. glass |
| 2 On burnin | g a piece of wood, the | energ | y stored in it is |
| converted | into ener | gy. | |
| chemical | - sound | b. chemical – the | ermal |
| c. thermal – sound d. thermal – chemical | | | |
| 3 When the | driver increases the spe | eed of the car, | to war in B |
| a. the fuel in | ndicator goes up | | |
| b. the fuel in | ndicator goes down | | |
| c. the gasoli | ine in the fuel tank inc | creases | |
| d. the amou | int of consumed fuel | decreases | * |
| 4 | can be used in oper | ating all means of t | transportation. |
| a. Coal and | gasoline | b. Gasoline | (Only one 10) |
| c. Natural g | as | d. Gasoline and | natural gas |
| 5 Coal Is but | rned to produce | om der i tellt i fedelitäter i di | (Cairo 202) |
| a. sound en | ergy | b. natural gas | |
| c. thermal energy d. wood of trees | | | |
| 6 When gas | oline burns inside the | car's engine, | is produced |
| which caus | ses the movement of t | the car. | |
| a. kinetic en | ergy | b. sound energy | |
| c. light energ | | d. chemical ener | |
| 7 Coal is use | ed in all the following p | ourposes, except | III- 4- sucks sq. sq. code (a. defendament of the code |
| a. warming | houses | b. operating car. | S |
| c. cooking for | | d. generating ele | _ |
| 8 Which ene | rgy chain shows the e | nergy changes that | t occurs when |
| gasoline is | burned inside the car | 's engine? | |
| a. Chemical | energy -> Therma | ıl energy — Kine | tic energy |
| b. Chemical | energy → Kinetic e | energy Therm | nal energy |
| c. Thermal energy> Kinetic energy> Chemical energy | | | |

d. Kinetic energy → Thermal energy → Chemical energy

| Q2. | Pu | it (✓) or (X): | | |
|--|-----|---|--------------------------------|--------|
| | 1 | Gasoline comes from oil that is extracted from underground. | | |
| | | | (|) |
| | 2 | As the speed of the car increases, the amount of the used fuel | | |
| | | decreases. | (|) |
| | 3 | Both coal and wood produce thermal energy when they are bur | | |
| | | (Giza - Suez 2023) | |) |
| | 14 | Coal can be used to produce electrical energy. (Alex. 2024) | (|) |
| : | 5 | When coal is burned, thermal energy is converted into chemical energy. | (|) |
| | 6 | A car would continue to move if it runs out of fuel. | (|) |
| Q3. | W | rite the scientific term: | | |
| | 1 | It is the main source of most forms of energy on the Earth's surfa | эсе. | ٠ |
| | | (Cairo 2023 - Alex, 2024) (| 110111-11-11-1 |) |
| 2 It is any substance that produces thermal energy when it is burn | | | | |
| | | (Menoufia 2023 - Dakahlia 2024) (| Melter Jemper- |) |
| | 3 | It is the form of energy which is released when fuel is burned. | | |
| | | b the transference beautiful and the second | i ja- ilaasiii ilaa |) |
| | 4 | It is the form of energy which is stored in coal. | odi 40 armarai |) |
| | 5 | It is a liquid which can be used as fuel for cars. | - a - 3 and 3 - 0 + 0 10 nd + |) |
| Q4. | Co | mplete the following sentences: | | |
| | 1 | and are forms of fuel found in car fuel stations. | | |
| | 2 | Some forms of fuel can be used in cooking food, such as | 7 h ff hin s on s-con | 100-04 |
| | | and | | |
| Ш | . 3 | Some forms of fuel, such as and, can be | | |
| | | used in warming houses. | | |
| | 4. | Fuel is used as a source of energy. (Alex. 2 | 2023 | 3) |
| | 5 | In electric power stations, is burned to produce | | |
| | | energy. (Behira 2 | 2024 | 1) |
| | 6 | energy is needed to cook food and boil water. | | / |

Q5. Choose from column (A) what suits it in column (B):

| Column (A) | Column (B) | |
|----------------------|--|--|
| 1 The Sun | a. goes down when the amount of gasoline in the fuel tank decreases. | |
| 2 Fuel | b. emits light energy that changes into chemical energy in plants. (Fayoum 2024) | |
| 3 The fuel indicator | c. produces thermal energy when it is burned. [Alex, 2024] | |

| Q6. Give reasons for: | Q6. | Give | reasons | for: |
|-----------------------|-----|------|---------|------|
|-----------------------|-----|------|---------|------|

| 1 All means of transportation depend on fuel to move. | |
|--|--|
| HERMAN AND AND AND AND AND AND AND AND AND A | names of H to 16 to be t |
| 2 Humans use fuel for several purposes every day. | W. (2007) 40m. W MCMAGE NO. (Edit: 10: Momentalistical |
| THE STATE OF THE S | · vargosgssgssbsbsbsbeddeliginkers, speed before |

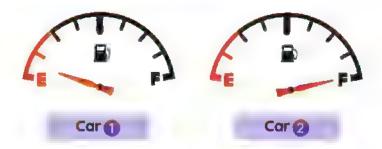
| Wood is considered fuel. | (Cairo 2023) |
|--------------------------|--------------|
| | |

Q7. What happens:

| 1, If you burn a piece of coal? | (Dakan ta 2024) |
|--|--|
| | (According to the changes of energy) |
| m.m. had fill still still still to the m. mention mediated designs extension members remained equipments | The state of the s |
| repriet. Any of A state of many man and many many through the property of the production of the production of the state of | |

| 2 | To the car's movement if the fuel in it runs out? | (Giza 2023) |
|-----|--|--|
| | White is a sufficient to the supplier of the s | " 11 MARJAN MARAMAKAN TANSKI TAKTON T |
| | | ************************************** |
| 3 | To the amount of fuel in the car when the driver increases | its speed? |
| *10 | | -=ININIMITETETETETETETETETETETETETETETETETETET |

Q8. Study the following figures, then complete the sentences below:



- 1 This device is called a ____ and it helps the driver check the amount of ___ in the car's tank.
- 2 The driver in car (____) needs to go to the nearest gas station quickly.
- 3 The fuel tank is full with gasoline in car (____).

Lesson

Activity 4 Types of Fuel

>>> Put (√) or (X):

- 1 Gasoline is a liquid that is used as fuel for cars.
- 2 Both coal and wood can be used in warming houses.

Fuel

It is any substance that releases thermal energy when it is burned. الوقود: هو مادة تُنْتج طاقة حرارية عند حرقها.

> Types of Fuel can be classified into two types, which are:



Biofuel الوقود الحيوب

Examples:







Wood Charcoal Some plants (Corn, grass, and wood chips)



Biofuels are renewable sources of energy.

Because they can be renewed as plants grow.

Fossil fuel الوقود الحفري

Examples:







Coal

Oil

Natural gas



Fossil fuels are nonrenewable sources of energy.

Because they are gone and cannot be easily renewed.



Biofuels

(Renewable resources of energy)

 They are fuels that are made from living organisms that can be planted, such as plants. الوقود الحيوى: هو الوقود الذي يُنْتُج من الكائنات الحية التي يمكن زراعتها.

Examples:





Charcoal



Some plants



Wood is the oldest or most ancient, fuel and is still used all around the world.

Charcoal is made from wood.

Some tupes of plants, such as corn, wood chips, and grass, can be used to make liquid fuel.

- يُعتبر الخشب من أقدم أنواع الوقود، وما زال يُستخدم في جميع أنحاء العالم. • يُصنع الفحم النباتي من الخشب.
 - ه يمكن تحويل العشب والذرة ورقائق الخشب إلى وقود حيوى سائل.

Biofuel Conservation

 Although biofuels are renewable energy resources. they should be conserved, where:



- Using wood as fuel requires cutting down trees.
- Cutting down trees at a faster rate than they can grow leads to deforestation.
- Deforestation has a negative impact on our environment.
 - قطع الأشجار بوتيرة سريعة يؤدى إلى إزالة الغابات.
- استخدام الخشب كوقود يتطلب قَطْح الأشجار.
- إزالة الغابات لها تأثير سلبي على بيئتنا المبطة بنا.

NOTE

 Some trees grow a few centimeters every year and reach their full height in more than one human's lifetime.

هذاك أشجار تنمو سنتيمترات قليلة كل عام، ويستغرق اكتمال نموها مدة أطول من عُمْر الإنسان.



Fossil Fuel

(Nonrenewable resource of energy)

 It is the fuel that is formed from the remains of plants and animals that were buried and decomposed over millions of years ago.

Examples:





Coal was formed from the decomposition of the remains of ancient plants.

Remains of ancient paints (buried underground)

> are decomposed and turned into

> > coal.





- Oil and natural gas were formed from the decomposition of the remains of ancient sea animals.
- Gasoline is a fuel that is formed from oil.

Remains of ancient sea creatures

decomposed and turned into

oil and natural aos.

- ، يتكوُّن الفحم من تحلُّل بقايا النباتات الجافة القديمة.
- و يتكوَّن النفط والغاز الطبيعي من تحلُّل بقايا الكائنات البحرية القديمة.
 - البنزين هو وقود مشتق من النقط.

NOTES

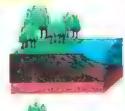
- All forms of fossil fuels are extracted from underground.
- Fossil fuels take a long period (millions of years) of time to be formed, which means that we use them faster than they are formed.
- · The primary source of both biofuel and fossil fuel is the light energy from the Sun.
 - الوقود الحفرى يُستخرج من باطن الأرض،
 - ، يتَشَكَّل الوقود الحفري ببطه شديد على مدى ملايين السنين، وهذا يعني أننا نستخدمه بشكل أسرع من معدل تكوُّنه.
 - . الشمس هي المصدر الأساسي للوقود الحيوي والوقود الحفري.

Formation of Coal

Millions of years ago, large areas of Earth were covered in swamps, with a lot of plants growing nearby.

When these plants died, their remains were covered with hundreds of meters of mud and rocks.

Those remains turned into coal due to the effect of heat and pressure.









- 🚺 منذ ملايين السنين، كانت مساحات كبيرة من الأرض مغطاة بالنباتات والستنقعات.
- [2] عدما ماتت تلك النباتات، غطتها مثات الأمتار من الطين والصخور تحت سطح الأرض.
 - 3 بفعل الحرارة والضغط، تحوّلت بقايا النباتات الجافة إلى قهم.

Comparison between Fossil Fuel and Biofuel

| FIGN | (Austi Fed) | No. |
|------------------------------|---|--|
| It is made from | The remains of living organisms that were buried and decomposed over millions of years. | Living organisms that can be planted. |
| Examples | 1 Coal 2 Oil 3 Natural gas 4 Gasoline | 1 Wood 2 Grass3 Corn4 Charcoal5 Liquid fuel |
| Its primary source | The Sun | |
| Renewable or Nonrenewable | Nonrenewable energy resources | Renewable energy resources |

Oil and Water

- Oil and water are two types of resources that humans can use.
- >>> There are some similarities and differences between oil and water.

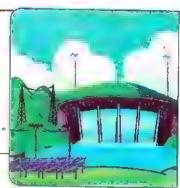
Oil and Water





 Both oil and water can be used to generate electricity.

. بمكننا استغدام النفط والماء لتوليد الطاقة الكهربية.



- Oil is a nonrenewable resource, while water is a renewable resource.
 - النفط مورد غير متجدد، بينما الماء مورد متجدد.

Nonrenewable Energy

- They are natural resources that are used faster than they can be replaced.
- · المصادر غير المتجددة: هي مصادر طبيعية تُسْتَهْلُك دمه أسرع من معدل تجدُّدها،

Renewable Energy Resources

 They are natural resources that can be replaced soon after they are used.

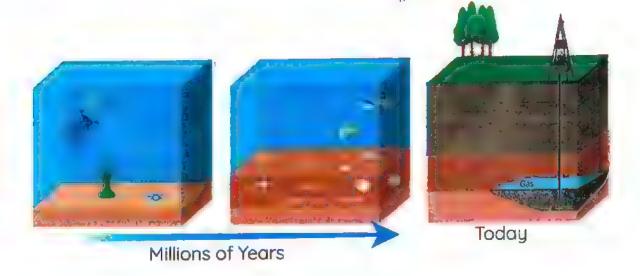
مي مصادر طبيعية تتجدُّد بعد وقت قصير من الاستخدام.



Oil: Nonrenewable Resource of Energy

- >> Oil is extracted from underground.
- Oil is formed from the decomposition of ancient sea creatures.

Formation of



>>> When marine organisms died, their remains settled on the sea floor.

Over many millions of years ago:

- >> Layers of sediments and rocks covered the remains of the sea creatures.
- >> Over time, those remains were converted into oil due to extreme heat and pressure.

عندما ماتت الكائنات البحرية استقرت في قام المصط.

خلال ملايين السنين، تراكمت طبقات الصخور والرواسب على الكائنات البحرية المدفونة.

مع مرور الوقت، تحوَّلت تلك البقايا إلى نفط تحت تأثير الضغط والحرارة الهائلين.

Water

>>> Water is a r quickly as w

Water is a renewable energy resource, but it may not be replaced as quickly as we need, so we should use it carefully to conserve it.

على الرغم من أن المياه مصدر متجدد، إلا أنه يجب علينا استخدام المياه بحرص وعدم إهدارها أو تلويثها.

إذا تمنا بإهدار المياه أو تلويثها، فقد لا نستطيع تجديد المياه بالسرعة والمقدار الذي نحتاجه.



Water is considered a renewable energy resource.

Because water can be renewed and replaced soon after it is used.



How can we conserve these resources



We can conserve oil by:

- Reducing the use of private vehicles.
- Using public means of transportation,

We can conserve water by:

- Growing plants that don't need large amounts of irrigating water.
- Avoid wasting and polluting water.





Exercises on Lesson 2

| Q1. Ch | oose | the | correct | answer: |
|--------|------|-----|---------|---------|
|--------|------|-----|---------|---------|

| 1 management is is | considered the ma | ain resource of ene | ergy on the |
|--|--------------------|-------------------------------|--|
| Earth's surface | | | |
| a. Gasoline | b. Natural gas | c. The Sun | d. The moon |
| 2 All the following | g are found deeply | under the Earth's | surface, except |
| ************************************** | | | (Giza 2024 |
| a. oll | b. coal | c. natural gas | d. green plants |
| 3 Ancient people | used | as a form of fuel b | efore discovering |
| gasoline. | | | (Behiera 2024 |
| a. wind | b. wood | c. oil | d. coal |
| 4 Extreme heat a | nd pressure unde | r the Earth's surface | e has an |
| important role i | in forming | | (Giza 2023) |
| a. wood | b. wind | c. fossil fuel | d. biofuel |
| 5 Coal was forme | ed under the Earth | 's surface from the | remains of |
| 4- sende and | | | (Cairo 2024) |
| a. dead animals | b. dead plants | c. dead humans | d. dead insects |
| 6 Fossil fuel is ext | racted from | offered age to the set of the | (Behiera 2023) |
| a. the Earth's sur | face | b. underground | |
| c. food | | d. water | |
| is a | type of biofuel wi | hich is made of wo | od. (Cairo 2023) |
| a. Coal | b. Oil | c. Charcoal | d. Natural gas |
| Fossil fuel is for | med due to the ef | fect of extreme | NAME OF STREET STREET, |
| a. evaporation | | b. cooling | - |
| c. freezing | | d. heat and press | sure |
| 🕦 and | ican | be used to make it | quid biofuel. |
| a. Oil - wood chip | os | b. Charcoal - gra | SS |
| c. Grass - com | | d. Wood chips - c | charcoal |
| 10 Liquid biofuel co | an be made from s | some | |
| a. animals | | b. rocks | |
| c. marine organis | ims | d. plants | |
| | | | / |

| 11 | The second secon | is a renewable sourc | e of energy. | (Port Said 2 | 202 |
|----|--|------------------------|--------------------|---------------------|-----|
| a | ı. Coal | b. Natural gas | c. Water | d. Fossil fue | el |
| 12 | We should | to conser | ve oil. | | |
| a | ı. increase th | e usage of private v | ehicles | | |
| b | . use public | vehicles instead of p | rivate ones | | |
| C | . use private | vehicles instead of | oublic ones | | |
| d | l. stop using | biofuel completely | | | |
| 13 | Both water | and oil | | | |
| O | ı. are renewa | able resources of ene | ergy | | |
| b | . are nonren | ewable resources of | energy | | |
| C | . take million | s of years to be form | med | | |
| d | l. can be use | d to generate electri | icity | | |
| 14 | Which of the | e following can be us | ed to produce | liquid fuel? | |
| | | | | (Menoufia : | 202 |
| C | . Wind | b. Rocks | c. Corn | d. Coal | |
| Pu | ot (√) or (X): | | | | |
| 1 | The Sun is ti | he primary source of | both biofuel a | nd fossil fuel. | |
| | | | | (Fayoum 2024) | (|
| 2 | Wood is the | oldest fuel which is r | no longer used | nowadays. | (|
| 3 | Biofuel is one | e of the nonrenewable | sources of ener | gy. (Qalyubia 2023) | (|
| 4 | Coal and oi | are used faster than | they can be re | eplacea. | (|
| 5 | Fossil fuel is | made from living or | ganisms that c | an be planted. | (|
| 6 | All types of | fuel are extracted fro | om undergroun | nd. | (|
| 7 | Using wood | of trees as a form fo | ossil fuel leads t | to deforestation. | (|
| 8 | Water and | gasoline are two rene | ewable resourc | es of energy. | |
| | | | | (Cairo 2023) | (|
| 9 | Water may | not be replaced as a | juickly as we no | eed it. | (|
| 10 | Charcoal is | a type of biofuel. | | (Alex. 2024) | (|
| 11 | Charcoal is | formed from the dec | omposition of | remains of ancie | nt |
| | plants. | | | (Qalyubia 2023) | (|
| 12 | Biofuel is or | ne of the nonrenewal | ole resources o | f energy. | |
| | | | | (Fayoum 2024) | (|
| | | | | | |

| | 13 Coal is one of the renewable resources of energy. (Snark a 2024) (|) |
|-----------------|---|---|
| | 14 Reducing the usage of private vehicles helps to conserve oil. (|) |
| | 15 Planting crops that need a large amount of water for irrigation conserves water. (|) |
| Q3. | · Correct the underlined words: | |
| | Gasoline is considered biofuel. |) |
| | The moon is the main source of both biofuel and fossil fuel. (Cairo 2023) (|) |
| | Wood chips can be used to make solid biofuel. (|) |
| | We should increase the usage rate of fossil fuel. |) |
| | Coal takes a short period of time to be formed. |) |
| | 6. Fossil fuel is made from living organisms that can be plantea. | |
| ı | Water is one of the nonrenewable energy resources. |) |
| ⊥ 24. | Write the scientific term: | |
| | It is a form of fossil fuel that was formed from dead marine animals! (Behiera 2024) (| , |
| | They are the energy resources that take a very long period of time to be renewed. (Alex. 2024) () | |
| | It is a form of fossil fuel that was formed from dead plants under the effect of extreme heat and pressure. (Cairo 2023) () | |
| | It is a natural resource that can be replaced soon after it is usea. | |
| | 15 It is the fuel made from living organisms that can be planted. | |
| | (Damiella 2024) () | |

| | | | ! | | |
|-----|------|--|----------------|-------------------------------------|--------------------------|
| Q5. | . Co | mplete the f | ollowing sen | tences using the words be | etween the brackets |
| | | _ | | vood - deforestation - ur | |
| | 1 | Ancient per | ople used | in cooking | food and warming. |
| | 2 | Gasoline is | made from | while co | oal is extracted from |
| | 3 | Cutting tree | es at a fast r | ate causes | I who I |
| | 4 | AND AND MALE AND | fuel co | an be made from some p | lants, such as |
| | | · | and g | rass. | |
| Q6 | . Co | mplete the | e following | sentences: | |
| | | | | can be classified into two | main types, which |
| | | are | ar | nd | · (Alex. 2024 |
| | 2 | Extreme he | eat and press | sure under the Earth's sur | face has an |
| | | important i | role in formin | 19 · · · · · · | (Charbia 2024 |
| | 3 | | | amples of | |
| | 4 | ******************************* | is the | fuel produced from living | organisms that can |
| | | be planted | | | (Qalyubia 2024 |
| | 5 | *************************************** | is con | sidered the oldest fuel. | (Sharkia 2024 |
| | 6 | Wood and | charcoal are | e examples of | , while |
| | | ······································ | and | are examples of f | fossil fuel. (Cairo 2023 |
| | | | | energy resource. | |
| | 8 | | | are examples of biofu | |
| | 9 | | | and management summer our source in | |
| | | needed for | the formation | on of fossil fuel undergrou | ınd. |
| Q7. | . Cł | noose from | column (A |) what suits it in colum | n (B): |
| | C | olumn (A) | | Column (B) | |
| | 1 | The Sun | a. takes a v | very long time to be form | ned. |
| | 2 | Oil | b. is a form | of biofuel and it's made | from wood. |
| | | | | | (Alex. 2024) |
| | 3 | Charcoal | c. is the pri | mary source of both bio | fuel and fossil fuel. |
| | | | | | |

| B. Arrange the follo | wing steps according | to the formation of coal: |
|------------------------|---|--|
| a.() The tre years. | e has been transforme | d into coal over millions of |
| b. () The tree | e remains are buried un | der the Earth's surface. |
| c.() The tree | · · | ed to high pressure and |
| d. () An old t | tree died. | |
| Cross out the odd | l word: | |
| 1 Wood - Oil - Wa | ater - Charcoal | (do: headelf if it it at a to it is not a to it it it it is |
| 2 Coal - Wood - N | latural gas - Oil | Co 10 2023) (|
| 3 Grass – Wood ch | nips - Com - Coal | (- AMARIAN METALERICATURE TO A PROTECTION AND A PROTECTI |
| P.O.C | Fossil Fuel | Biofuel |
| P.O.C Renewable or | Fossil Fuel | Biofuel |
| Nonrenewable | 41 Ex 1 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | Jeffic Hode Addic of Add - I pagenty |
| Examples | | a at 100 at 100 at 100000 (100000000000000000000000000000 |
| 0 | | |
| P.O.C | Coal | Charcoal |
| Type of Fuel | ekondokundukkadukkan kennikan dilikin 1911-1919, sen menjiliksi supropranja perbasiwan s s | Applehological and discrete rate and core influences set the Strate set of Strategic and white discrete field and set of Strategic and Strateg |
| Primary Source | at Marian is | gorge-space and a process of the company of the com |
| Renewable or | | |

Q11. Give reasons for:

1 Fossil fuel is considered a nonrenewable resource of energy. 2 Wood is considered a renewable resource of energy. 3 Using wood from trees as a fuel has negative effects on the environment. (Cairo 2023) 4 Coal is considered a type of fossil fuel. 5 We must conserve fossil fuels. (Menoulin 2023) Q12. What happens if: 1 The remains of old plants buried under the Earth's surface are decomposed? 2 We cut down trees at a faster rate than they can grow? 3 The remains of marine organisms were buried under the Earth's surface over millions of years?

Lesson 3

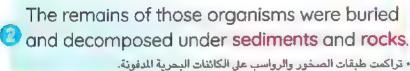
Activity 6 Fossil Fuel Formation

>> Fossil fuel is a nonrenewable energy resource that is formed due to the decomposition of ancient (old) marine organisms.

Formation of Oil

Marine organisms died millions of years ago.

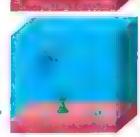
• منذ ملايين السنين، ماتت الكائنات البحرية واستقرت في قاع المحيص





Those remains were turned into oil or natural gas as a result of extreme heat and pressure.

ه مع مرور الرقت، تحرَّات تلك البقايا إلى نفط تحت تأثير الضغط والحرارة الهائلين.



Today

Millions of Years

Evaluate Your Learning!

- Arrange the following steps involved in the formation of oil and natural gas:
 - (_____) Those remains were turned into oil and natural gas due to the effect of extreme heat and pressure.
 - (____) The remains of marine organisms were buried under sediments and rocks.
 - (_____) Marine organisms that lived a long time ago died.

Renewable Energy Resources

Nonrenewable Energy Resources

Such as

(Water - Wind)

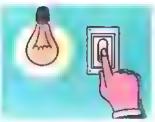
Such as (Oil - Natural gas)





- >> In many regions, electricity is generated from nonrenewable energy resources.
- >>> Recently, renewable energy resources are used in generating electricity.

Whatever the resource of energy is, renewable or nonrenewable. we should conserve it by many methods, such as:



Turning off lights in an empty room or when not needed.



Unplugging unused electric appliances (devices)



You should turn off unneeded lights and unplug unused electric appliances. To conserve electricity.

What happens if:

Electric current is being cut off?

We can use candles instead of electric lamps, and pen and paper instead of using a computer.

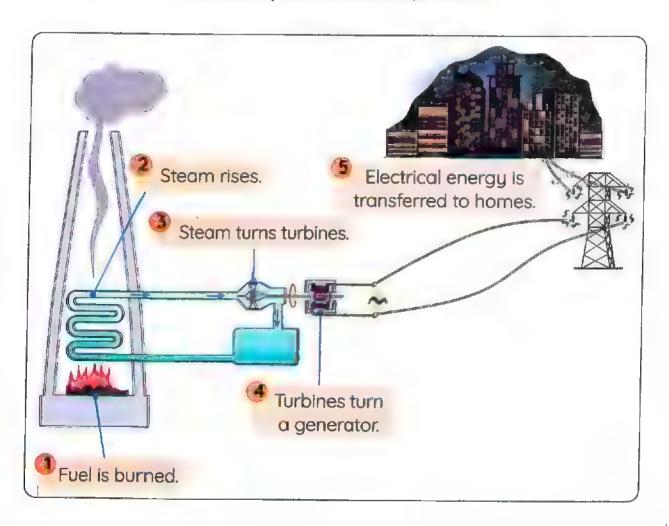
(Activity 8 Using Fossil Fuel to Generate Electricity

>>> Put (✓) or (✗):

- 1 You don't have to unplug the electric devices that you don't need.(
- 2 We can conserve electricity by using energy-saving light bulbs. (

Generating Electricity Using Fossil Fuels

Fossil fuels, such as coal, natural gas, and oil, are burned in the electric power stations, where:



- - Fuel is burned.
- · When fuel (coal, oil, or natural gas) is burned, it releases thermal energy.
- Steam rises.
- This thermal energy is used to heat water to produce steam.
- Steam turns turbines.
- The steam is directed through pipes to tubes to turn turbines.
- The generator spins.
- The kinetic energy produced from the movement of the turbine is used to operate a generator.
- The generator converts kinetic energy into electrical energy.
- Electrical energy is transferred to homes.
- Electrical energy travels through cables to homes, businesses, and factories to operate different devices.

| حرق الوقود | عندما يحترق الوقود (الفحم أو البغط أو الخاز الطبيعي) يُنتج طاقة حرارية. |
|-----------------------------|--|
| ايرتفع البخار | تُستخدم هذه الطاقة الحرارية في تسخين المياه لتكوين بخار الماء. |
| تتحرك التوربينات | يُوجُه البخار إلى أنابيب لتشغيل التوربينات، |
| يدور المولد | تعمل التوربينات على دوران المولد؛ وبالتالي يتم تحويل الطاقة الحركية إلى طاقة كهربية، |
| نقل الطاقة الكهربية للمنازل | تنتقل الطاقة الكهربية عبر الكابلات إلى المنازل والشركات والمسابع لتشغيل الأحهزة. |

What happens if:

- Water is heated in electric power stations? It turns into steam that operates turbines.
- Water isn't heated in electric power stations? Turbines won't be operated.
- A generator is operated by the movement of turbines? It changes kinetic energy into electrical energy.
- A turbine connected to a generator is damaged in an electric power station?

The generator won't be operated, and it can't produce electricity.

Exercises on Lesson

Q1. Choose the correct answer:

| All the follow | ving are renewable re | esources of ene | rgy, except |
|------------------------------------|------------------------------------|--------------------|---------------------------|
| | | | (Cairo 2023 |
| a. natural gas | b. water | c. the Sun | d. wind |
| 2 Renewable | resources of energy | include | |
| a. oil | b. wind | c. coal | d. natural gas |
| 3 | is a renewable sour | ce of energy. | (Port Said 2024 |
| a. Coal | b. Natural gas | c. Water | d. Fossil fuel |
| All forms of | fossil fuel are formed | 1 | (Behiera 2024 |
| | water surface | | |
| c. in the air are | ound us | d. above the l | Earth's surface |
| 5) In electric po | wer stations, when w | vater is heated, i | t turns into |
| a. steam | b. oil | c. coal | d, natural gas |
| 6 In power plan | nts, the movement o | f the generator | produces |
| energy. | | | |
| a, thermal | b. kinetic | c. potential | d. electrical |
| The steam pr | roduced in the electr | ic power station | passes through |
| pipes to tube | es to turn | 271 V | |
| a. generators | b. motors | c. mills | d. turbines |
| 8 The electrica | l energy producea fr | rom electric pow | er stations is |
| transferred th | hrought | o homes. | |
| a. tubes | b. air | c. wires | d. fans |
| 9 | and are i | included in fossil | fuel's formation. |
| a. Heating - co | poling | b. Decaying - | heating |
| c. Burying - co | oling | d. Decaying - | growth |
| 10 In electric por | wer stations, water is | turned into stee | om by the effect of |
| е | energy produced from | m burning | mpananangananangangang, g |
| a, kinetic – fuel | | b. thermal - we | ater |
| c. thermal – fue | el | d. electrical – v | vater |
| | | | |

| 1.1 | We must fossil fuel first to obtain energy. (Alex. 202 | 4) |
|-----|---|-----|
| C | a. wash b. cook c. cool d. burn | |
| Pu | ıt (✓) or (X): | |
| 1 | The movement of a generator in an electric power station produces | 3 |
| | potential energy. (Giza 2023) (|) |
| 2 | Wind and water are considered nonrenewable energy resources. | |
| | (Alex. 2024) (|) |
| 3 | Electricity can be generated from nonrenewable energy resources | |
| | only. |) |
| 4 | Turbines are operated by steam in electric power stations. (|) |
| 15 | You should turn off lights that you do not need. [Alex 2027, (|) |
| 6 | We have to conserve all forms of fuel. (Cairo 2023) (|) |
| 7 | Oil is a liquid biofuel which is used to generate electricity. (|) |
| 8 | Generators convert electrical energy into kinetic energy. (A ex 2024) (|) |
| `9 | On cooling water, it turns into steam in electric power stations. (|) |
| .10 | Water is a source of renewable energy. (Menoufia 2024) (|) |
| 11 | Remains of living organisms are buried and decompose under high | 1 |
| | temperature and low pressure. (|) |
| 12 | Leaving the unused electric devices turned on conserves electricity | |
| | (|) |
| C | orrect the underlined words: | |
| -1 | Biofuel is used inside the electric power station to generate | |
| | electricity. |) |
| 2 | In electric power stations, oil is used to operate turbines. | |
| | (1000 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |) |
| 3 | When fossil fuel is heated in electric power stations, it produces | |
| | sound energy. (|) |
| 4 | Fossil fuel includes coal, oil, and wood. (Qena 2023) (| .) |
| | | |

| . Write the scie | entific term: | | | | | |
|-------------------|---|--|--|--|--|--|
| 1 They are er | ergy resources that include wir | nd energy and water | | | | |
| energy. | | (| | | | |
| 2 It is the ener | rgy released from burning fossi | I fuel in electric power | | | | |
| stations. | | described and the contract of | | | | |
| 3 It is the ener | rgy produced from the movement | ent of the generator. | | | | |
| | | THE OWNER OF THE PARTY OF THE P | | | | |
| | material used in electric power | | | | | |
| | steam on heating to operate turbines. | | | | | |
| 5 It is the devi | ce that is turned by steam in th | | | | | |
| | | (************************************* | | | | |
| 6° It is a device | e in an electric power station the | at changes kinetic energy | | | | |
| Into electric | () | | | | | |
| | following sentences: | | | | | |
| | 1 Turbines in electric power stations are turned by | | | | | |
| and they pr | and they produce energy to run the | | | | | |
| | ic power stations. | | | | | |
| 2 · In electric p | ower stations, generators chang | ge energy | | | | |
| | intoenergy. | | | | | |
| | 3 Water is considered a resource of energy. | | | | | |
| | ower stations, when is h | | | | | |
| | d are renewable sour | 4 | | | | |
| Choose from | column (A) what suits it in c | olumn (B): | | | | |
| Column (A) | Column | (B) | | | | |
| 1 Generators | a. is a renewable energy reso | urce. | | | | |
| 2 Turbines | b. produce electricity in electri | ectricity in electric power stations when | | | | |
| | they move. | | | | | |
| 3 Water | c. is a nonrenewable energy r | esource. | | | | |
| | | | | | | |

| Q7. Cross out the odd word: |
|--|
| Rocks and sediments – Moonlight – Extreme heat – High pressure |
| THE PROPERTY OF THE PROPERTY O |
| 2 Water - Oil - Coal - Natural gas |
| Q8. Arrange the following steps for generating electricity at an |
| electric power station: |
| a. () Steam starts to move the turbines. |
| b. () Oil is burned to produce thermal energy. |
| c. () Electricity is transferred through cables to cities. |
| d. () The generator converts kinetic energy into electrical energy |
| e. () Thermal energy heats water and turns it into steam. |
| Q9. Give reasons for: |
| 1 We must turn off lights that we do not need. |
| He-SHAMMergerery (1992) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1 |
| 2 Generators are important in electric power stations. (Alexander Lander) |
| Q10. What happens if: |
| 1 Oil is burned inside electric power stations? |
| The state of the s |
| The state of the s |
| 2 The steam produced from heating water is directed towards |
| turbines? |
| The state of the s |
| 3 Water is heated in electric power stations? |
| THE RESERVE THE RE |
| 4 A generator is operated by the movement of turbines? |
| a service operated by the movement of tolomies; |
| The state of the s |
| 5 The turbine that operates the generator in an electric power station |
| is damaged? |
| |
| |

esson

Activity 9 Big City Environmental Concerns

The increase in people's needs and their industrial and agricultural activities causes many pollution problems around the world.

Reasons of Pollution in Big Cities

Burning fuel

produces smog that pollutes the air.



يُنْتُج عن حرق الوقود الضبب الدخاني الذي يلوث الهواء.

MORR

Pesticides used on farms are carried into canals and rivers by rainfall, leading to soil and water pollution.



البيدات المشرية المستخدمة في الزارع تختلط مع مياه الجداول عند سقوط الأمطار؛ مما يسبب تلوث التربة والبياه.

Using chemicals

in factories pollutes the air. and .



المواد الكيميائية المستخدمة في المصانع تؤدى لتلوث الهواء والمياه والتربة.

Effects of Air Pollution on Humans' Health

Smog from cars and factories in big cities causes:

- 1 Irritation of humans' eyes and lungs
- 2 Damage of the respiratory system tissues.

يتَسبُّب الضَّباب الدخاني الصادر من السيارات والمصانع في المن الكبري في: 📆 تهيُّج عيون الإنسان والرئة. [2] تدمير أنسجة الجهاز التنفسي.

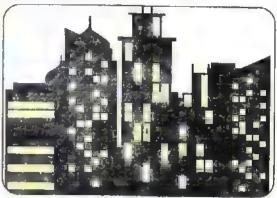


 Smog is full of harmful small particles that humans breathe in, which irritate the lungs and damage the respiratory system tissues.

Activity 10 Burning Fossil Fuel and Pollution

- >>> People depend on burning fossil fuels to get the needed energy to:
 - Operate trains, cars, and ships.
 - Supply houses, factories, and schools with electricity.
- Fossil fuels are burned in electric power stations to generate electricity that is transferred to different areas through electric wires.





Harms of Burning Fossil Fuel

- >>> Burning fuel, such as coal and oil, produces carbon dioxide gas, which causes acid rain and global warming.
 - Acid Rain:

How it is formed:

 Carbon dioxide gas combines with water in the air to form acid rain.

Harms:

- 1 Death of trees
- Changes in the chemical nature of soil
- 6 Changes in the chemical nature of lakes, causing death of fish
- O Dissolving some rocks, including bricks of buildings

[] موت الأشجار، [2] التغيرات الكيميائية في تركيب التربة. [3] التغيرات الكيميائية في تركيب البحيرات؛ مما تسبب في موت الأسماك. *

[4] تحلُّ بعض الصحور وطوي المراني،



Global Warming:

How it is formed:

- The amount of carbon dioxide gas in the air increases, forming a layer in the atmosphere.
- This layer traps heat on the Earth, causing a slow rise in the Earth's temperature.



[2] تُحبِس هذه الطبقة الحرارة على الأرض؛ مما يؤدي إلى ارتفاع درجة حرارة الأرض ببطء.



How to reduce acid rain and global warming



The best solution is to conserve energy.

الحل الوحيد الأمثل لوقف الأمطار الحمضية والاحترار العالى هو الحفاظ على الطاقة.

Reducing the usage of energy

causes

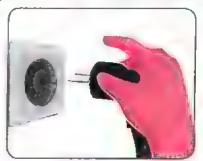
Decreasing the amount of fossil fuel burned to generate energy

couses

Decreasing the amount of carbon dioxide and other pollutants in the air

، ترشيد استهلاك الطاقة يُقلن من حرق الوقود؛ مما يُقلل كمية غاز ثاني أكسيد الكربون في الهواء.





Conserving energy reduces pollution, it also conserves nonrenewable energy resources and keeps the Earth clean.

الحفاظ على الوقود يجعله يدوم لفترة أطول ويمنع تلوُّث كوكب الأرض،

Conserving Fossil Fuel

From the productions is seens, we have learned that:

- >>> Fossil fuel is considered a non enewable natural resource of energy.
- >> Fossil fuels take millions of years to be formed, which means that they can't be replaced as quickly as we consume them.
- >> The amount of fossil fuel available on Earth is limited,
- >> Fossil fuel will run out from the Earth if we don't conserve its usage.

Conserving Fossil Fuel

Walking or using bikes instead of driving a car



TILL

Turning off the lights when you aren't in the room



Replacing fossil fuel with renewable energy resources, such as:

- Solar energu
- Hudroelectric energy
- Wind energy

Using renewable energy resources to generate electricity is more expensive than using fossil fuel.

This transaction of Using Festy Feel

When some forms of fossil fuel are burned, they emit gases that cause:

- Air pollution.
- @ Global warming, which causes:
 - a. Rising the Earth's temperature. b. The change of Earth's climate.

Activity 12 Using Fuel

>> Classify the following resources in the following table:

| Resources | |
|----------------|---|
| 1 Coal | ~ |
| 2 Charcoal | |
| 3 Wood | |
| 4 oil | |
| 5 Natural gas | |
| 6 Solar energy | |
| 7 Wind energy | |
| 8 Gasoline | |
| 9 Water | |
| 10 Liquid fuel | |

Activity: 13 Record Evidence Like a Scientist

>> Now, try to think like a scientist by writing your hypothesis (claim), your evidence, and your scientific explanation about one of the main points of this concept.



>> How can you describe fuel and road trips now?

| My Claim: | |
|--|--|
| The state of the state of the second | MIN MANAMAMAN INCOMES MANAMAN MANAMAN MANAMAN MANAMAN MANAMANA |
| * MI STATES A . WOME IN . ANY JOHN DAY OF SECURITIES WAS VIEW ORDER OF WASTERDE TO WOMEN AND MANAGEMENT AND | i rakkinor emisterakkin randahanan dan palaminentrakki kisar at salam at 1000,000 0 0 0.000,000 00,000,000 00,000,0 |
| -SEED DESCRIPTION OF THE PROPERTY OF THE PROPE | De - SANSANDANO-CO. De - SANSANDANO-CO-CONTRACA CO-CONTRACA CONTRACA CONTRA |
| | |
| Evidence: | |
| The statement of the st | e dale ferial Malde veri ettersesser desertin destallen variablesed biskleben variablemen errogiansjansjans invest |
| | information of the polyments of the second o |
| - MBH MANASHI MANASHAR A fi Telefolystylan - S happamenynyddionadaganynyddionagan y Ambarddion - S Ambarddion - S | entition |
| | P |
| Scientific Explanation wit | h Reasoning: |
| >> | and the first of the second of |
| #15-ESP-ESS | and address the dissellent and address the section of the section |
| MANU A A BURNISDANICE OF CONTRACT OF CONTR | Distribution (Distribution) |

Exercises on Lessons 4 and

| Choose the cor | rect answer: | | |
|--------------------------------|------------------------------------|----------------------|---------------------|
| Fossil fuels ne | eed to b | oe formed under th | ne Earth's surface. |
| a. few years | | b. many years | |
| c. hundreds of g | years | d. millions of ye | ars |
| Smog damag | es the tissues of the | e human's | system. |
| a. digestive | b. circulatory | c. respiratory | d. nervous |
| Among the following | llowing resources, v | we must conserve | |
| | | | (Alex. 2023) |
| a. solar energy | and coal | b. wind and oil | |
| c. solar energy | and wind energy | d. oil and coal | |
| All the following | ng are renew <mark>able re</mark> | sources of energy | , except |
| IIIIIIIII | | | (Cairo 2023) |
| a. natural gas | b. water | c. the Sun | d. wind |
| Cars' smog co | auses irritation of hu | Jmans' | ws) • |
| a. stomach | b. brain | c. heart | d. eyes |
| The gases em | itted from burning | fossil fuels cause c | all the following, |
| except that the | ey | | |
| a. pollute the air | r | | |
| b. decrease the | Earth's temperatu | re | |
| c. change the Ed | | | |
| _ | Earth's temperature | | |
| To conserve for | ossil fuels, we have t | to do all the follow | ing actions, |
| except | | | (Cairo 2023) |
| | soline with natural | | |
| | soline with s <mark>olar en</mark> | | |
| | ural gas with <mark>sola</mark> r | | |
| d. replacing coa | al with wind energy | 1 | |
| | | | |

| _ | | |
|---|--|---|
| | Oil and coal have all the following | ing properties, except that they |
| | a. are nonrenewable energy res | sources |
| | b. have a limited amount on Ear | rth |
| | c. produce carbon dioxide on be | urning |
| | d. are forms of biofuel | |
| | (Increasing the amount of | gas in the atmosphere cause |
| | global warming. | |
| | a. hydrogen | b. oxygen |
| | c. carbon dioxide | d. nitrogen |
| | Dissolving bricks of a building i | s a result of |
| | a. global warming | b. oxygen gas |
| | c. deforestation | d. acid rain |
| | When mixes with w | vater of canals and rivers, it causes |
| | water and soll pollution. | |
| | carbon dioxide gas | b. smog |
| | c. pesticide | d. rain |
| | Carbon dioxide traps | in the atmosphere, causing globa |
| | warming. | |
| | a. gases b. water vapo | r c. pressure d. heat |
| | Using to produce e | electricity costs a lot of money. |
| | a. solar energy b. oil | c. fossil fuel d. coal |
| | Burning fossil fuel produces | Nobel Mel Mel Mel Mel Mel Mel Mel Mel Mel M |
| | a. thermal energy | b. carbon dioxide gas |
| | c. chemical energy | d. a and b |
| | Burning fossil fuels to get energ | gy causes all the following, except |
| | H11/10 000 000-000 400-004 (02-70-1941)-1-03.1.101)-20-1-0 | |
| | a. pollution | b. acid rain |
| | c. global warming | d. deforestation |

Q2. Put (/) or (X):

| On burning oil and coal, carbon dioxide gas is | produced. (| |
|--|---------------------------------------|----|
| When the burning rate of fossil fuel increases, | the temperature of | |
| Earth decreases. | . (| |
| When carbon dioxide gas combines with water | er in air, acid r <mark>ain</mark> is | |
| formed. | (| |
| The chemical nature of lakes and soil changes | when acid rain fall | S |
| on them. | (| |
| To keep the Earth clean, we must replace nonr | renewable energy | |
| sources with renewable ones. | (| |
| The amount of fossil fuel on Earth is unlimited. | (| |
| Increasing the ratio of carbon dioxide in the air | r reduces the Earth's | 5 |
| temperature. | (|) |
| ® Smog consists of large particles that humans I | oreathe in, damagin | g |
| the respiratory system. | (|) |
| Smog doesn't cause any damage for the huma | an respiratory syste | m. |
| | (Alex. 2023) (|) |
| (ii) Global warming is one of the disadvantages of | f using fossil fuel to | |
| produce energy. | (|) |
| Acid rain irritates the humans' eyes and lungs. | (|) |
| As a result of global warming, the temperature | of the Earth | |
| Increases. | (Port Said 2024) (|) |
| (B) Carbon dioxide gas combines with water in the | e air, causing global | |
| warming. | (Qalyubia 2024) |) |
| (Coal, oil, and natural gas are used to produce | electricity. | |
| | (Dakahlia 2024) (|) |
| The use of fossil fuels to produce energy costs | more money than | |
| using renewable resources. | (Giza 2023) (|) |
| 16 Wind, oil, and natural gas are natural resources | s used to generate | |
| clean energy. | (Cairo 2023) (|) |
| Using fossil fuels protects the environment from po | llution.(Cairo 2023) (| _) |

| (| ကြ |
|---|----|
| | |
| | |

| Q3. | Correct the underlined words: | |
|--|---|---|
| | Acid rain is formed when oxygen gas combines wit | h water in the air. |
| | | (|
| | Wood is a fossil fuel that is used in warming houses | S. |
| | (Qena 2023 |) (statements the relative terror and consequence |
| | 3 On using solar energy instead of fossil fuels, the Ea | rth's temperature |
| | increases. | () |
| | (4) Smog causes water pollution. | (» « « « » « » « » » » » » » » » |
| | If we don't conserve the usage of fossil fuel, its amo | ount on Earth will |
| | increase. | () |
| Q4. | Write the scientific term: | |
| It is a phenomenon in which the Earth's temperature increase | | re increases when |
| | carbon dioxide gas increases in the air. | (IIIIIIII II |
| | t is the rain that can dissolve some rocks of building | gs. |
| | | (|
| | 3 It is a gas that causes global warming and acid rain | 1.(|
| It is a gas produced from burning fossil fuels and cau | | auses the |
| | formation of acid rain. | *** **The Control of the Contr |
| Ш | They are energy resources that include all kinds of | fossil fuels. |
| | | () |
| Þ | lt is a pollutant produced from cars and irritates hu | imans' eyes and |
| | lungs. | () |
| | It is the system whose tissues are damaged due to | breathing big |
| | amounts of cars' smog. | (|

- To avoid air pollution, we must use ______ resources of energy, such as water.
- Death of fish is a result of the change in the chemical nature of as a result of the ______ falling on them.
- Burning a piece of coal produces _____ gas and energy.
- energy resources that can be used instead of fossil fuels.
- The pollution of ____ caused by ____ causes the death of trees.
- When pesticides mix with the water of a river, it leads to the pollution of _____ and ____.
- Factories may cause pollution of _____, and _____, and ______ due to the chemicals they use. (Ca'ro 2023)
- Global warming causes the _____ of Earth to rise and change
 Its _____ (Giza 2023)
- can't be replaced as quickly as they are used because they take _____ of years to be formed.

Q6. Choose from column (A) what suits it in column (B):

| Column (A) Column (B) | | |
|---|--|--|
| (I) OII | a. causes the Earth's temperature to rise. | |
| 2 Water | b. is a liquid fossil fuel that runs out faster than wind. | |
| Carbon dioxide c. irritates humans' lungs and eyes. | | |
| Smog d. is a renewable resource of energy. | | |
| | | |

Q7. Compare between:

| P.O.C | Acid Rain | Global Warming |
|---------------------|--|--|
| Reason of Formation | f | MT PT 1/PT/PT/PT/PT/PT/PT/PT/PT/PT/PT/PT/PT/PT/ |
| Disadvantages | The second secon | appealing in the second of the |

Q8. Give reasons for:

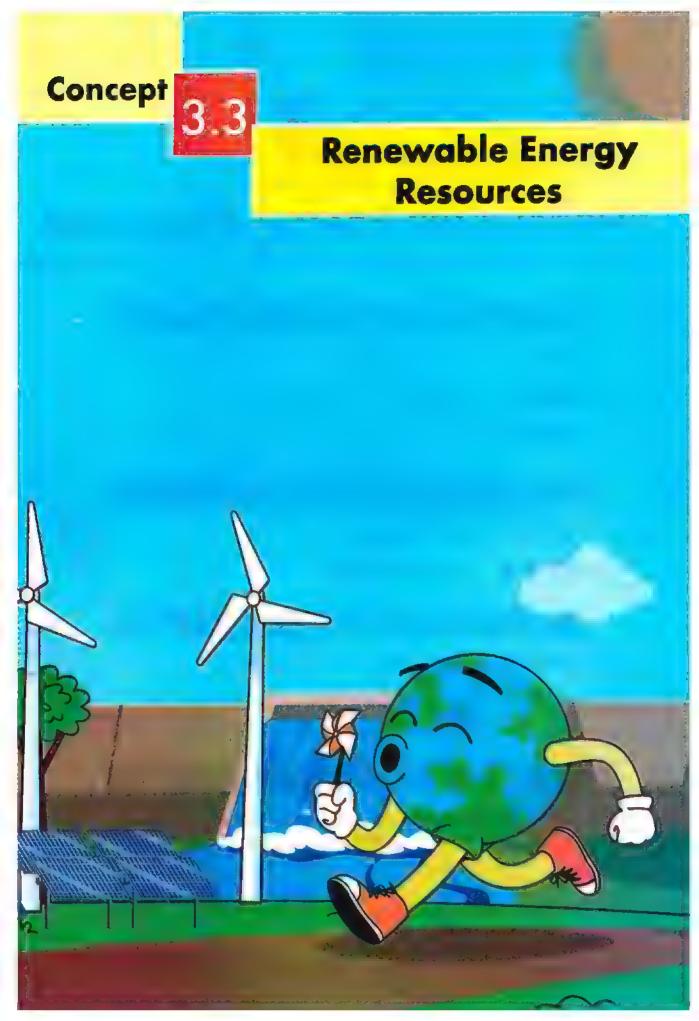
- 1 Breathing in smog has bad effects on humans' health.
- 2 We must use renewable energy resources instead of fossil fuels.
- 3. Burning large amounts of some fossil fuels causes global warming.
- Farmers should avoid the overuse of pesticides.
- 5 Acid rain may cause the death of fish living in a lake.

Q9. What happens to:

- 1 The Earth's temperature if the amount of carbon dioxide in air increases? (Alex. 2024)
- 2 The water of a river if pesticides mix with it?
- 3 Buildings if acid rain falls on them?

(Dakahlia 2023)

- The amount of carbon dioxide gas on Earth if we don't conserve the usage of fossil fuels?
- 5. The amount of smog in a city if people use more bikes instead of cars?



Concept 3

Renewable Energy Resources

| granden and a contraction | the same of the sa |
|--|--|
| | Lesson 1 |
| Activity 1 | Can You Explain? |
| Activity 2 | Windmills and Watermills |
| Activity 3 | Using Energy from the Sun |
| | |
| | Lesson 2 |
| Activity 4 | Solar Energy |
| Activity 5 | Harness the Wind |
| | |
| Contraction of the Contraction o | Lesson 3 |
| Activity 6 | Falling Water |
| Activity 7 | Hands-on Investigation: Modeling a |
| | Turbine Generator |
| المراجعة المشاهرين أحيار والمقامين | and the same of th |
| - | Lesson 4 |
| Activity 8 | Record Evidence Like a Scientist: Windmills and Watermills |

Glossary

| Lesson (1) | | | | | |
|--------------------|------------------------|------------------|---------------------|------------------------------------|--------------------|
| Activity | | | | | |
| Solar energy | الألواح الشمسية | Wind turbines | الترربينات الهراثية | Water turbines | التوربينات الماثية |
| Activity | | | | | |
| Machines | ועונה | Blades | شفرات | Grind the grains | طحن العبوب |
| Flour | الدقيق | Cost | ₹#K5 | Blow | تهپ |
| Function | مظيفة | Watermilis | طواحين المياه | Windmills | ملواحين الهواء |
| Activity | 8 | | | | |
| Sunrays | أشعة الشمس | Radiant energy | الطاقة الإشعاعية | Atmosphere | الغلاف انجوي |
| Greenhouse | الصوبة الزراعية | Farmers | المزارعون | Crops | محاصيل |
| Climate | مناخ | Concave mirrors | المرايا المنحنية | Collect | تجمع |
| Solar panels | الألواح الشمسية | Pipes | أنابيب | | |
| | | Lesson | (2) | was a great and a state of Andrews | |
| renviñes . | and | | | | |
| Irrigation equipme | معدات الر <i>ي</i> nt: | Generator | المواد | | |
| | | Lesson | (3) | - manufacture | |
| and vity | أسيسي | | | | |
| Doms | السدود | Hydroelectricity | الطاقة الكهرومائية | | |
| Motivity | | | | | |
| Pinwheel | مروحة ورقية | Water cycle | دورة المياه | Refill | إمادة تعيثة |
| Evaporation | عملية التبخر | Condensation | عملية التكثيف | | |

Lesson 1

Activity 1 Can You Explain?

>> In the previous concept, we have learned that:

Renewable Resources of Energy

They are natural resources that are replaced (renewed) at a faster rate than they are consumed.

We can generate electricity using different

renewable energy resources, such as:



C. C. POINER.

Generate electricity to operate light posts in streets by using solar energy.



Generate electricity using the kinetic energy of wind.



William Burblings

Generate electricity using the kinetic energy of water.

ſ

In this concept, we will study:

- Renewable energy resources.
- Wind turbines and water turbines.
- The uses of solar energy.
- Generating electricity using the wind's movement.
- Generating electricity using the water's movement.

Activity 2 Windmills and Watermills

- >> Imagine you were born 400 years ago before electricity.
 - Hundreds of years ago, people needed machines to make their lives easier.
 - · Windmills and watermills were used to crush grains to make flour.

Windmill



Watermill



Way of Working

- 1 The kinetic energy of the wind moves the mill's blades.
- 2 The kinetic energy transfers to the other parts of the mill.
- The kinetic energy of the water moves the mill's blades.
- The kinetic energy transfers to the other parts of the mill.

Importance

• They are used to crush (grind) grains and make flour.



Advantages

- Low cost
- Renewable energy resources

Disadvantages



- Sometimes the wind doesn't blow, so it can't do its main job.
- Sometimes, the water source may dry up, so it can't do its main job.

| Machines | الآلات | Windmilis | الطواحين الهوائية | Watermils | الطواحين المائية |
|----------|--------|----------------|-------------------|-----------|------------------|
| Blades | شفرات | Internal parts | الأجزاء الداخلية | Cost | تكلفة |
| Blow | تهب | Dry up | تجف | | |

Modern wind turbines are used now instead of old windmills.





Function

- They are used to generate electricity.
- They are used to grind the grains to make flour.

Differences

- They are taller than the old windmills.
- Theu have fewer blades than those of old windmills.
- blades.
- They are shorter than the modern wind turbines.
- They have more blades than those of modern wind turbines.
- They have no openings in their,
 They have openings in their blades.

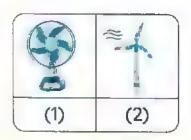
Similarity

They depend on the kinetic energy of the wind to be operated.

"Evaluate Your Learning!

Study the opposite figures, then complete:

The device in figure (_____) is used to generate electricity that is used to operate the device in figure (____).



| Modern turbines | التوربينات الحديثة | Old windmills | الطواحين القديمة |
|-----------------|--------------------|---------------|------------------|
| Function | | Openings | فتحات |

Activity 3 Using Energy From the Sun

- >> The Sun is the main source of all kinds of energy on Earth.
- >> The Sun provides us with light and heat
- >>> Living organisms need the Sun to survive.



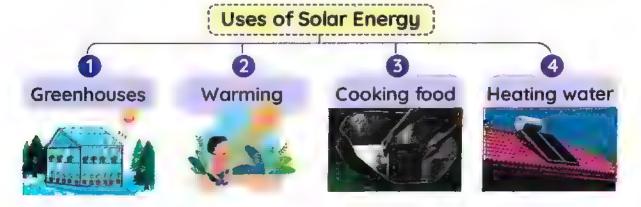
You can feel the warmth of the Sun at night, even though it is not visible. Because the atmosphere, water, and Earth's surface absorb the energy of the Sun, causing a rise in the Earth's temperature.

Solar Energy

- The energy coming from the Sun is called solar energy, which includes light and thermal energy
- Solar energy contains a type of energy called radiant energy (radiation), which is found in the sunrays.



- نستخدم الطاقة الشمسية كمصدر للمصول عن الطاقة الحرارية.
- يُطلق على الطاتة الصادرة من الشمس الطاقة الشمسية.
 - يُطلق على أشعة الشمس الإشعاع أو الطاقة الإشعاعية.



1 Greenhouses:

Importance

 They help farmers plant the crops that only grow in warm climate.

How does it work?

- A greenhouse allows the entry of solar energy (radiant energy).
- 2. Radiant energy is changed into thermal energy inside it.
- 3 Thermal energy warms the inside of the greenhouse.

الأهمية:

تساعد المزارعين على زراعة المحاصيل التي لا تنمو إلا في المناخ الدافئ.

•كيفية عملها:

🕕 تسمح الصوبة الزراعية بمرور الضوم والطاقة الإشعاعية للشمس.

(2) تتموُّل الطاقة الإشعاعية إلى طاقة حرارية.

القوم الطاقة الحرارية بندفئة الصوبة الزراعية من الداخل.

2 Warming:

Warming Ourselves



Solar energy can be used directly as a source of thermal energy when exposing yourself to the sunrays to feel warm.

ويمكن استخدام الطاقة الشمسية مباشرة كمصدر للصاقة
 الحرارية عند تعريض نقسك للشمس لتشعر بالدفء.

Warming Houses



 Houses can be built in a way that enables the energy of the Sun to warm them by placing large windows on the walls that face the Sun.

يمكن بناء المنازل بصريقة تُمكَّن طاقة الشمس من تدفئتها
 بوضع نوافذ كبيرة على الحوائط المراجهة الشمس.

3 Cooking Food:

Concave (curved or convergent) mirrors

 They collect and focus sunlight on a metal pot to cook the food inside it.



تُستخدم المرايا المجمعة (المقعرة/المنحنية) لتوجيه أشعة الشمس الواني الطهي؛ لطهي الطعام بداخلها.

4 Heating Water:

Solar water heater:

Structure:

· It contains panels made of black pipes,



Location:

It can be placed on the roofs of houses.

How does it work?

- As water passes through the pipes, it heats up.
- 2 The heated water is stored in a water tank to be used later.
 - التركيب: تتكوَّن من ألواح شمسية مصنوعة من أنابيب سوداء.
 - الموقع: تُوضع على أسطح المنازل.
 - و كيفية عملها:
 - 🚺 يتم تسخين الماء عشما يمر عبر تلك الأنابيب.
 - 2] يتم تخزين الماء الساخن في خزان الماء؛ للاستخدام في وقت لاحق.

Evaluate Your Learning!

>>> Put (\(\sigma \)) or (\(\xi \):

- Concave mirrors are used to collect and focus sunlight on pots to cook food inside them.
- The solar water heater contains solar panels to heat water. ()

Exercises on Lesson 1

Q1. Choose the correct answer:

| 1 | All the following a | re examples of re | newable energy re | sources, |
|----|-----------------------------------|---------------------|----------------------|-----------------------|
| | except | | | (Cairo 2023) |
| | a. sunlight | b. waterfalls | c. wind | d. fossil fuels |
| 2 | Modern wind turk | oines are | than old windmills | (Behira 2024) |
| | a. taller | b. shorter | c. heavier | d. slower |
| 3 | The main function | n ofis gri | nding grains to ma | ake flour. |
| | modern wind t | turbines | b. solar panels | |
| | c. dams | | d. watermills | |
| 4 | Both modern win | d turbines and ok | d windmills are sim | nilar in their |
| | a. blades' numbe | er | b. input energy | |
| | c. height | | d. blades' shape | • |
| 3 | One of the disadv | vantages of wind | energy is that | sonomb an orrero at E |
| | a. It has a high co | ost | | |
| | b. wind doesn't b | low sometimes | | |
| | c. it can't be rene | ewed | | |
| | d. It is a nonrene | wable energy res | ource | |
| 6 | In wind turbines, t | heenergy o | of the wind is chan | ged into electrical |
| | energy. | | | |
| | a. kinetic | b. thermal | c. sound | d. light |
| 7 | Radiant energy is | s the energy prod | luced from | (Shark'a 2024) |
| | a. water | b. the Sun | c. wind | d. the moon |
| 8 | Solar energy is co | nverted into | energy in greenho | uses. (Cairo 2023) |
| | electrical | b. sound | c. thermal | d. potential |
| 2 | Using concave m | irrors in cooking i | s one of the benef | its of using |
| | a. wind | b. water | c. sand | d. solar energy |
| 10 | Solar panels depe | end on the energy | of the Sun to produ | ce energy. |
| | a. solar | b. electrical | | d. light |
| | | | | |

| | Concapt (8) |
|----|-------------|
| J. | |
|) | |
|) | |
| е | |
| ۱. | |

| 1 | collect and focus sunrays | • | | · |
|----------|---|--------------------|-----------------------|-----|
| | a. Concave mirrors | b. Greenhou | | |
| 470 | c. Solar panels | d. Solar wate | | |
| | In winter, greenhouses help farme | | | |
| | a. cold weather | b. warm wed | | |
| | c. less water | d. less sunlig | nt | |
| 22. | Put (✓) or (X): | | | |
| (i | Windmils always do their job bed | cause the wind | never stops blowi | ng. |
| | | | (Behira 2023) (|) |
| (2 | The Sun is the main source of ene | rgy on Earth. | (Cairo 2023) (|) |
| (3 | Both modern wind turbines and | old windmills o | are used to genera | ate |
| | electricity. | | (|) |
| 4 | Both manual mixers and electric r | nixers use elec | trical energy to be | |
| | operated. | | · (|) |
| (8) | The Sun provides the Earth with lig | ght and heat. | (Behira 2023) (|) |
| 4 | Modern wind turbines convert kinet | ic energy into e | electrical energy.(|) |
| 7 | Greenhouses help farmers grow p | lants that need | d cold weather. (| |
| 8 | A solar water heater is formed of | panels made o | of black pipes. | |
| | | (Al Gho | irbia - Cairo 2024) (| |
| 9 | In wind turbines, kinetic energy i | s converted in | ito chemical energ | gy. |
| | | | (Cairo 2023) (|) |
| TRO | If the water source of a watermill o | ries up, it will c | ontinue doing its jo | ob. |
| | · | , , | (. | |
| 3 | Write the scientific term: | | • | |
| 670 | | at include wie | d operall and wat | or |
| | They are the energy resources the energy. | idt inclode win | a energy and war | |
| A | | | • | * |
| | It is a mill that is operated by wind mo | , | • | |
| (3) | It is a mill that is turned by water fl | · | | |
| | It is the type of energy that is prod | | · | |
| | different home devices. | (Ismaili | ia 2023) (| _) |
| | | | _ | |

| It is a panel designed to absorb the energy of the Sun to generate |
|---|
| electricity. (Qalyoubia 2023) () |
| lt is a device that consists of black pipes used to heat water by using |
| solar energy. () |
| They help farmers in cold regions to plant crops which grow only in |
| warm climate. (Qalyoubia 2023) (|
| 4. Complete the following sentences: |
| Renewable energy resources include, and |
| (Behira 2023) |
| The wind movement has energy, which moves the windmill's |
| blades. (Giza 2024) |
| energy is the input energy in both windmills and watermills. |
| Both wind and water movement are used to generate |
| energy that is used to operate devices. (Cairo 2023 - Alex. 2024) |
| 6 Old windmills are than modern wind turbines. |
| The number of blades in modern wind turbines is than in |
| old windmills. |
| When we expose our bodies to the Sun, we feel |
| (B) We can use solar energy in cooking using concave, which |
| collect and focus the onto the metal pots to heat them. |
| (Behira 2024) |
| When solar energy is used to cook food, concave mirrors work to |
| Menoufia 2024) |
| 10 Solar energy is converted into energy in greenhouses. |
| (Alex. 2024) |
| (Alex. 2024) |
| The Sun provides the Earth with and (Behira 2023) |
| help farmers grow crops that need warm weather. |
| |

| 25. Correct the under | rlined words: | | | | |
|---|---|--|--|--|--|
| Windmill and modern wind turbines are used in grinding grains.() | | | | | |
| A solar water heater is used to generate electricity to turn on light | | | | | |
| posts of streets. | : · · · · · · · · · · · · · · · · · · · | 0 Annual productive department of the second | | | |
| The energy found | in the sunrays is called | | | | |
| | | Carlo - 100 to the state of the | | | |
| Wind turbines prod | duce electricity by using | g the water movement. | | | |
| | | (| | | |
| The moon is the m | nain source of energy o | n Earth. | | | |
| To warm houses, s | mall windows should be | e placed on the walls facing | | | |
| the Sun. | 1 | A secular consequence consequence and an income and an income and secular and | | | |
| The temperature in | nside of a greenhouse i | s <u>less</u> than that outside it. | | | |
| l 16. Cross out the odd | word | REMET DE CHIEFTE CONTROL CONTR | | | |
| Sun - Wind - Wate | | (Cairo 2024) (| | | |
| | | | | | |
| Solar panel - Solar | r water heater – Manua | (| | | |
| 7. Compare betwee | an' | , | | | |
| 9 14.V | 1 + 1 - 1 - 1/1 | | | | |
| P.O.C | Old Windmills | Wind Turbines | | | |
| Function | | By the should not recharate the segment of the segment of the segment of the second segment of the second stage quest | | | |
| | | | | | |
| Number of Blades | | and the control of th | | | |
| Height | page tare that had the had the till to have | William Control on the Control of th | | | |
| | | | | | |

| C | - choose nom | Column (A) What soils if in column (b); | |
|---|-----------------|---|--|
| | Column (A) | Column (B) | |
| | 1 Wind turbines | a. were used to grind grains. | |

from column (A) what quite it in column (R).

2 Solar panels b, convert the kinetic energy of wind into electrical energy.

3 Old windmills c. are used in heating water.

v) (a) (a)

Q9. Mention one use of each of the following:

@ Greenhouses:

2 Windmills:

3 Modern wind turbines;

Solar water heaters: _____

(5) Concave mirrors:

Q10. Study the following figures, then complete the sentences below:



Figure 0



Figure 2

Figure (____) is used to grind grains.

2 The device in figure (____) is shorter than that in figure (____).

If the wind doesn't blow on the mill in figure (2), it will stop generating energy.

Both devices depend on the _____ energy of the wind to do their job.

Q11. Study the following figure, then complete the sentence below:

This device is called a _____, which has _____ colored pipes to heat up _____.



| Q12. | Give reasons for: |
|----------|---|
| 1 | People used windmills and watermills hundreds of years ago. |
| 2 | People depend on different machines in their lives. |
| 3 | You feel the warmth of the Sun at night, even though it is not visible. |
| 4 | Greenhouses are very important for farmers. |
| <u> </u> | What happens if: |
| | Sunlight falls on solar panels? (Giza - Red Sea 2024) |
| 2 | Wind doesn't blow in an area that contains wind turbines? |
| 3 | A greenhouse is built in an area that is not exposed to any sunlight? |
| | MICHAEL MANAGEMENT AND |

Lesson 2

Activity 4 Solar Energy

>> Put (/) or (x):

- The energy received from the Sun is called solar energy.
- Even at night, we can feel the warmth of the Sun's energy.
 ()

Solar Panels

Importance:

Most solar panels are used to generate electricity.

أستخدم معظم الألواح الشمسية لتوليد الكهرباء.

Structure

They consist of a large number of small solar cells.

• تتكوِّن من العديد من الخلايا الشمسية الصغيرة.

How do they work?

 Solar cells capture the radiant energy coming from the Sun and turn it directly into electricity.

ه تلتقط الخلايا الشمسية الطاقة الإشعاعية للشمس وتُحوَّلها مباشرة إلى كهرباء.

Solar panels can be:

Very small

 To supply only one light bulb
 with energy.



Very large

 To supply buildings or cities with energy.



*Uses of Electricity Generated by Solar Panels

They can be used directly to light streets.



- They can be used in houses to operate electric devices.
- They can be used to recharge some types of batteries, like solar-cell calculators.



They can be used to power irrigation equipment in some villages.

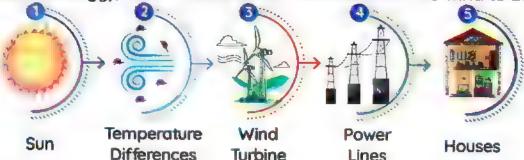


Evaluate Your Learning!

- Put (1) or (1):
- Electrical energy is considered the input energy of solar panels.
- Some calculators run on batteries powered by small solar cells.
- Houses may use electricity produced from rooftop solar panels.
- Small panels can supply energy to whole buildings.

Activity 5 Harness the Wind

- >> As the Sun warms Earth, it warms the air.
- Different regions of the world get different amounts of solar energy (radiant energy), which causes the air to move and the wind to blow.



- Radiant energy heats up air around the Earth to different degrees, causing a difference in temperatures between cold air and hot air, causing air to move and wind to blow.
- The kinetic energy of wind movement rotates the blades of wind turbines, which cause the rotation of turbines.
- Turbines convert kinetic energy into electrical energy.
- Electrical energy is transferred through large wires to cities to light houses and factories.
 - 🚹 تتسبُّب الطاقة الشمسية في حركة الهواء وهبوب الرياح.
 - [2] تقوم الرياح بتدوير شفرات التوربينات الهوائية التي تقوم بدورها بتشغيل المولدات.
 - 🗿 تقوم المولدات بتحويل الطاقة الحركية إلى طاقة كهربية. 🔑 تنتقل الكهرباء عن طريق أسلاك كبيرة إلى المدن لإنارة المنازل والمصانع.

NOTE

 When the kinetic energy of the wind increases, the blades rotate faster, so the efficiency of wind turbines increases.

Evaluate Your Learning!

- >>> Put (/) or (/):
 - The kinetic energy of the wind can be used to generate electricity.
 - 2 Wind blows due to differences in air temperature around the Earth.(

Exercises on Lesson 2

| Q | Choose | the c | orrect | answer: |
|---|--------|--------|---------|--------------|
| - | | 1110 4 | W11 V V | THE RESTRICT |

| Solar panels | can be used to ope | erate all the followi | ng, except | | |
|-------------------------------|-----------------------------|-----------------------|---------------------|--|--|
| a.a calculat | or | b.a greenhous | b.a greenhouse | | |
| c.irrigation | c.irrigation equipment | | | | |
| ② Theen | ergy of the Sun cau | ses air movement | s and wind blowing. | | |
| a.radiant | b. chemical | c.electrical | d.sound | | |
| If there's no o | difference in the air | temperatures arou | and the Earth, | | |
| a. wind with | a weak force blows | b. wind with a | strong force blows | | |
| c. wind won' | t blow | d.wind blows | at a high speed | | |
| When the blo | ades of wind turbine | s rotate, this cause | s the generators to | | |
| rotate, which | leads to generating | g energy. | (Alex. 2023) | | |
| a. electrical | b. solar | c. chemical | d.potential | | |
| CONVE | ert radiant energy i | nto electrical energ | gy. | | |
| a. Wind turbi | ines b. Solar panels | s c.Light bulbs | d.Watermills | | |
| When strong | wind blows on the | blades of a wind | turbine, the blades | | |
| ESSENTING POLICE CONTRACTOR D | | | | | |
| a.rotate slov | • | b.stop moving | | | |
| c.spin quickl | _ | d.rotate at a lo | , | | |
| | of some calculators | | theenergy | | |
| | the solar cells within | | | | |
| a .potential | | 3 | d.electrical | | |
| | nent about wind is a | | | | |
| | otates the blades o | | | | |
| | nes spin due to the | | | | |
| | gy causes the wind | | 15 4 | | |
| 4-34 | s due to the similari | | | | |
| | gy is the energy pro | | | | |
| a. Sun | b. water | c.wind | d .moon | | |

| 4 | 2. Put (/) or (X): | |
|---|---|----------|
| | A solar cell consists of many small solar panels. | () |
| | Solar cells can be used to recharge the batteries of some calculated | ators. |
| | | () |
| | Solar cells are designed to capture the radiant energy of the moon. | () |
| | Small solar panels may be able to light buildings. (| () |
| | When the kinetic energy of the wind increases, the wind turbine b | lades |
| | spin faster. | () |
| | Wind is a renewable energy resource. (Qalyoubia 2023) (| () |
| | Solar panels provide one light bulb with potential energy. (| () |
| | The kinetic energy of the wind is converted into electrical energy | gy by |
| | water turbines. | () |
| | Wind blows due to differences in air temperatures around the Ed | arth. |
| | | () |
| | n wind turbines, kinetic energy is converted into chemical er | iergy. |
| | (Cairo 2023) (| |
| | The change of energy in wind turbines is the opposite to that in ele | ectric |
| | fans. | |
| | Wind energy is a nonrenewable source of energy. (Alex. 2024) (| |
| | Water turbines rotate when their blades rotate as wind blows. | |
| | (Dakahlia - Damietta 2024) (| () |
| | Wind turbines generate electricity. (Cairo 2024) (| |
| 1 | 3. Write the scientific term: | . , |
| | It is a device that uses the wind to rotate its blades and generate | = |
| | electricity. | |
| | It emits radiant energy that causes the wind to blow. (| |
| | It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general It is a panel designed to absorb the energy of the Sun to general the sun to gen | |
| | | |
| | | |
| | It is a turbine that uses the power of wind to generate electricity. (C: 0003) | |

and face last one

- Alex

| ~ |
|----|
| CY |
| - |
| 4. |
| |
| T. |
| |
| .0 |
| U |
| |

| It is a type of energy produced from the Sun | , which causes the wind to |
|--|--|
| blow. | (|
| 24. Complete the following sentences: | _ |
| Wind blows due to the difference in | between the cold ai |
| and the hot air. | |
| By increasing the rotation of wind turbine | blades, the wind turbine |
| generates more energy. | (Alex2023 |
| As the energy of the wind inc | reases, the speed of the |
| turbine blades' rotation will | (Giza 2023 |
| The energy coming from the Su | n causes the air to move |
| and the wind to | |
| In some villages, solar panels are used to go | enerate electrical energy |
| which is used to operate | almanahmulyudu 🕏 |
| 25. Correct the underlined words: | |
| The electrical energy produced by wind turbing | nes is transmitted through |
| wind to cities and factories. | (************************************* |
| When weak wind blows on the turbine blade | s, they rotate quickly. |
| | S AND THE CONTROL OF THE PROPERTY OF THE PROPE |
| The light energy of wind movement causes to | the rotation of wind |
| turbines. | , Controlled and cont |
| Wind turbines are used to generate electrica | l energy to operate |
| irrigation equipment in some villages. | (New York of the Control of the Cont |
| Water turbines would be useless if they were | built in a region where |
| no wind blows. | (,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| 6. Give reasons for: | |
| Some calculators contain solar cells. | |
| Wind turbines are built in different regions are | ound the world. |
| | CONTROL OF THE CONTRO |

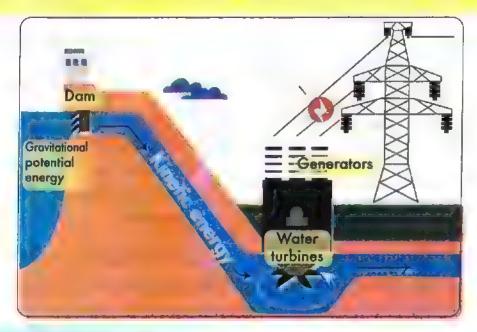
| The blades' speed of a wind turbine depends on the kine the wind. | etic energy of |
|---|--|
| What happens if: | - 1998, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, 1999, |
| Wind blows on the blades of a wind turbine? | |
| The kinetic energy of the wind blowing on a wind turbine | e increases? |
| There's a difference in temperatures of the air in a regio | n on Earth? |
| Sunlight falls on the solar cells of a calculator? | O STATE OF THE STA |
| | CONTRACTOR OF THE STATE OF THE |
| Study the following figure, then put (√) or (≝): | , v |
| This house depends on | j |
| This house depends on nonrenewable energy resources to Device (2) | Ż |
| This house depends on nonrenewable energy resources to operate different devices. Device (2) | Ż |
| This house depends on nonrenewable energy resources to operate different devices. Both device (1) and device (2) | |
| This house depends on nonrenewable energy resources to operate different devices. Both device (1) and device (2) produce electrical energy. | |
| This house depends on nonrenewable energy resources to operate different devices. Both device (1) and device (2) produce electrical energy. If there's no wind blowing, device (1) | |
| 1 This house depends on nonrenewable energy resources to operate different devices. () 2 Both device (1) and device (2) produce electrical energy. () 3 If there's no wind blowing, device (1) will not be able to do its job. () | |
| This house depends on nonrenewable energy resources to operate different devices. Both device (1) and device (2) produce electrical energy. If there's no wind blowing, device (1) will not be able to do its job. Device (1) Device (2) Device (1) Device (1) | |
| This house depends on nonrenewable energy resources to operate different devices. () Both device (1) and device (2) produce electrical energy. () If there's no wind blowing, device (1) will not be able to do its job. () Device (1) is composed of one solar cell. Device (1) depends on radiant energy to be operated. | |
| This house depends on nonrenewable energy resources to operate different devices. Both device (1) and device (2) produce electrical energy. If there's no wind blowing, device (1) will not be able to do its job. Device (1) Device (2) Device (1) Device (1) | () () the house |



- Hydroelectricity is a type of electricity generated by water turbines in places where dams are built on rivers and waterfalls.
- GR Dams are built on rivers.
- To control the flow of water.
 To increase the potential energy of water.

How can water be used to generate electricity





- A hydroelectric dam holds back the flow of water to increase its potential energy.
- When the water flows downhill by the effect of gravitational force it falls on the blades of water turbines, so the potential energy of water is converted into kinetic energy.
- The kinetic energy of flowing water is transferred to water turbines, causing them to rotate to operate generators to generate electricity.
- Electricity is transferred to cities through long electric wires.
 - 📊 يقوم السد بإيقاف مريان المياه؛ مما يؤدي لزيادة طاقة وضع المياه.
 - [2] عند تحرير المياه، تسقط المياه السفل تحت تأثير الجانبية الأرضية فتتحول طاقة الوضع إلى طاقة حركية.
 - [3] تنتقل الطاقة الحركية للمياه إلى توربينات المياه مما يؤدي لدورانها وتشغيل المولدات لتوليد الطاقة الكهربية.
 - 👍 تنتقل الكهرباء إلى المدن عبر أسلاك كهربية طويلة.

Hydroelectricity 놀 (Hydroelectric energy)

It is a type of electrical energy generated by water turbines in dams.

الطاقة الكهرومائية: هي نوع من الطاقة الكهربائية تُولِّدها التوريينات المائية في السدود.

Hydroelectric Dams

They are types of dams which are used to generate electricity using the flow of water.

>> The following table explains the differences and similarities between wind turbines and water turbines:





| POC | HILD THE MAIL | delle Lasia | | |
|--------------|--|---|--|--|
| Differences | They are used in places with strong winds. | They are used in places wher dams are built on rivers and waterfalls. | | |
| Similarities | Both of them are renewable resources of energy. Both of them use kinetic energy to turn turbines. Both of them are used to generate electricity. | | | |

Evaluate Your Learning!

>>> Put (/) or (/):

- 1 The electricity produced by water flow is known as electromagnetic energy.
- 2 Dams are built in places with strong winds.
- (3) Wind turbines and water turbines are renewable energy resources.
 - 4) As water flows downhill along a river, its kinetic energy decreases.(

Activity 7 Modeling a Turbine Generator

In this activity, we will design a model of a water turbine.

Experiment

Tools









Water bottle

Plastic cup

Steps:

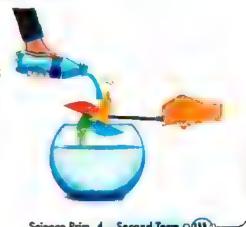
- 1 Use the materials to design a model of a water turbine.
- 2 Pour the water from the bottle onto the blades of the pinwheel.
- 3 When the water bottle runs out, use a plastic cup to refill it with the water in the bowl to pour the water over the blades again.

Observations:

- >> The blades rotate when water is poured over them.
- The blades stop when the water completely runs out.

Conclusions:

- >> The moving water has kinetic energy that is used to operate water turbines to generate hydroelectricity
- The water turbines will be operated all the time, as the water flows all the time.



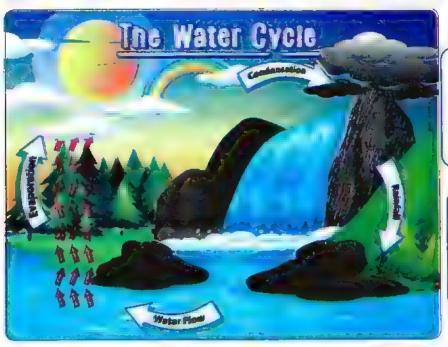
Unit. (S)

Water Cycle

>>> The river's water is a renewable energy resource that isn't immediately renewed to its source; this occurs through a process called water cycle.

How does the water cycle occur on Earth?

- The river's water flows into other water bodies and evaporates by the heat of the Sun, then condenses forming clouds.
- When rain falls from these clouds, the water returns to the river.



Evaporation:

It is the process in which water changes into water vapor.

Condensation:

It is the process in which water vapor changes into water.

ه لا تعود مياه النهر إلى منبعها، ولكن يتدفّق الماء إلى المسطحات المائية الآخرى حيث يتبخّر الماء ويتكثّف بعد ذلك في شكل شُحُب. وعندما يسقط المطر من هذه الشُّجُب يعود الماء مرة أخرى إلى النهر.



Evaluate Your Learning!

>>> Put (//) or (X):

- Water is a renewable resource of energy.
- In the water cycle, water condenses and then evaporates. ()
- The blades of water turbines rotate by the kinetic energy of wind.()
- Wind turbines can be used to generate hydroelectricity. ()

Record Evidence Like a Scientist: Windmills and Watermills

- >> In this concept, you have learned a lot about renewable and nonrenewable energy resources and the benefits of using renewable energy resources.
- >> What are the different ways to use renewable energy resources to generate electricity?

| | 901 1864 h 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | | | 44 W 197 (31 (47 | o managan | | 1888 - 18 |
|---|---|---|-------------------------------|--|---|---|--|
| ESEMBOSEI - ENMBALO-B- | Mad > x ls | danral vázki ladrikusa ta sásrráðið-taðiðskáðir |)))d()); | - H.H. II. I. ADAK | | 11.041444444444444444444444444444444444 | aser e erre a dere som a som som som errenne erren erlen erlen de halt de halt de datat et e de |
| Ev | idence: | | | | | | |
| .mrsv . andamely-bro-set | DIPO-PROMICE A CULLIFOR | edylow dl 1865-Evr.a | \$ \$44 \$44 \$6 Life Life \$ | | | ngdalam mana 118 metrallaret 1911 - yeldilerda | likus uur uu ruduulkal kaleid - urokuo riikkanonan rii sirroofi bilikus |
| INCRESCRIPTION OF THE SPECIAL PROPERTY OF THE SPECIAL | HANTE HANTENNET I SENIOR PROCESSOR TO SAME AND A SENIOR PROCESSOR TO SAME A SENIOR | ndra) - Newsia Saldandado SE (NewSelladdado EE) | | | . OF ATTOCOUNTY PROOF TO A | BI NOT LOVE OF BEING | 222 magyang p + p2 gm/ yang man hamabanya . Ido 14488444a dabi h |
| +ulleller at stabilishings | To accompanier value, as as security | dara amazan merintaman | ir | rukkir-ili Pillul-170-r-dreikkiul-+-244-ilillil- | tricklesselver and an external and external | T (A) \$ (A) | a + 88 के 88 के 88 का प्राप्त प्रथम प्रथम की प्रश्निक कर क्ष्मणेत्र व्यवस्थित व्यवस्थित व्यवस्था की है है । इस् |
| Sc | ientific E | xplana | tion wit | h Reaso | onina: | | |
| | | | | | g. | | |

Exercises on Lessons 3 and 4

Q1. Choose the correct answer:

| 1 is (ar | e) nonrenewable | resource(s) of en | ergy. | (Cairo 2024) |
|-------------------|---------------------|----------------------|------------|--|
| a. Waterfalls | b. Coal | c. The Sun | d.W | ind |
| 2 Water flows the | rough turbines in | hydroelectric dan | ns to ger | nerate |
| energ | gy. | | | (Giza 2023) |
| a. electrical | b. potential | c. solar | d. lig | ht |
| Water turbines | can generate m | ore electricity by | increasir | ng the |
| energ | gy of water that is | stored behind do | ams. | (Giza 2023) |
| a. sound | b. thermal | c. potential | d.ch | emical |
| When the water | r of rivers flows o | lownhill, its | weter ¶ | |
| a. potential en | ergy is converted | into kinetic energ | J y | |
| b. kinetic energ | gy is converted in | to potential energ | jy | |
| c. potential en | ergy is converted | into chemical en | ergy | |
| d. kinetic energ | gy is converted in | to light energy | | |
| In water turbine | es, thee | energy of water is | change | d into |
| electrical energ | jy. | | (Qc | nyoubia 2023 |
| a. chemical | b. kinetic | c. thermal | d. lig | ht |
| 6 The form of en | ergy resulted from | m waterfalls is cal | led | th and about define arrange around a date some |
| energy. | | | | (Qena 2023) |
| a. hydroelectri | c b.thermal | c. chemical | d.so | lar |
| When the Sun I | neats up the wate | er of a river, the w | ater | then |
| manufacture formi | ng clouds. | | | |
| a. condenses - | • | b. freezes – co | | 5 |
| c. evaporates | - condenses | d. evaporates | - melts | |

| 12. Put (✓) or (X): | |
|--|--|
| Waterfalls are considered nonrenewable | le energy resources. |
| | (Dakahlia 2023) (|
| Electrical energy can be generated from | n both waterfalls and wind |
| movement. | (Cairo 2023 - Gharbia 2024) (|
| The flow of water can be controlled to g | generate electricity in dams. |
| | (Cairo 2023) (|
| Electricity can be generated from water | r. (Cairo 2023) (|
| Water turbines generate electricity by the | he wind blow. (Dakahl'a 2024 |
| | (|
| Both wind movement and water flow has | ave kinetic energy. |
| | (Port Said 2024) (|
| When the water of a river flows downhil | ll, its speed and kinetic energų |
| increase. | . () |
| Water turbines are used to generate ele | ectricity in places that have |
| waterfalls and dams. | . () |
| 3. Correct the underlined words: | |
| Hydroelectric energy is one of the nonre | enewable energy resources. |
| | (Port Said 2024) (|
| Dams are built on rivers to control the w | vind flow. |
| The water flowing in waterfalls and river | rs has potential energy. |
| | Consideration of the considera |
| When the water falls downhill from a da | m, its chemical energy |
| increases. | Controlled policy of the control of |
| Dams are built on rivers to generate solo | ar energy. |
| | (Minia 2023) () |
| | |

| 4. Write the scientific term: | |
|--|--|
| 1 It is a turbine in which the kinetic energy of mo | oving water is used to |
| generate hydroelectric energy. (Cairo | 2023) (|
| (2) It is a type of electrical energy generated by tur | rbines in dams. |
| (Qalioubia : | 2024) (|
| 3 It is the force that causes the water of a river to | flow downhill. |
| | |
| It is the process in which the water of rivers evap | orate, then condenses |
| to return back to its source in the form of rain. | (in page administrative to the total and the contract of the c |
| 5. Complete the following sentences: | |
| 1 Both wind and water movement are used to ge | nerate |
| energy, which is used to operate devices. | (Alex 2024) |
| 2 In water turbines, the energy of v | vater movement |
| is converted into a type of electrical energy, wh | ich is called |
| ······································ | (Cairo 2023) |
| are used to control the flow of we | ater and increase the |
| energy of water to generate elec | ctricity. |
| When water is released from a dam, its potention | al energy |
| | (Kafr El-Sheikh 2024) |
| 5 The energy produced from water turbines is ca | lled |
| | (Alex Sharqia 2024) |
| Turbines convert kinetic energy into | energy. |
| | (Gharb'a 2024) |
| When the heat of the falls on the | e water of a river, the |
| water and changes into | hardynhlamicos representative E |
| 1 In the water cycle, when water vapor | , it changes into |
| , water, forming | |
| turbines are used to generate el | ectricity in places that |
| have strong winds. | |

Q6. Complete the following table:

| P.O.C | Wind Turbines | Water Turbines |
|--|---------------|--|
| It is used to generate electricity in places that have | | The last tendency and the second seco |
| Similarities | | n. n. n |

| (| Q7. | Give reasons fo | or: |
|---|-----|-----------------|-----|
| ш | | Olio Lembello L | |

| Dams are | built on r | ivers. |
|----------|------------|--------|
|----------|------------|--------|

| 2 | There | are | turbines | in | modern | wind | turbines | and | hydroelectric | dams. |
|---|-------|-----|----------|----|--------|------|----------|-----|---------------|--------|
| | | | | | | | | | (Al., | . 2024 |

Mex. 2024)

| 3 M | odern water | turbines are | connected to ge | nerators. | (Sharqia : | 2024 |
|-----|-------------|--------------|-----------------|-----------|------------|------|
| CO. | | | _ | | | |

Water is a renewable energy resource.

Q8. What happens if:

| Water flows through the water turbines in a dam? |
|--|
|--|

| The water of a rive | r starts to flow downhill? | |
|---------------------|----------------------------|--|

(According the change of energy)

- The Sun heats up the water in a river?
- The evaporated water from a river condenses in the atmosphere?

Q9. Study the following figure, then complete:



- At point (A), the water has the greatest gravitational energy.
- When the water flows downhill, its _____ energy is converted into _____ energy.
- turbines can be used in this waterfall to generate energy.

Q10. Complete the following energy chain:

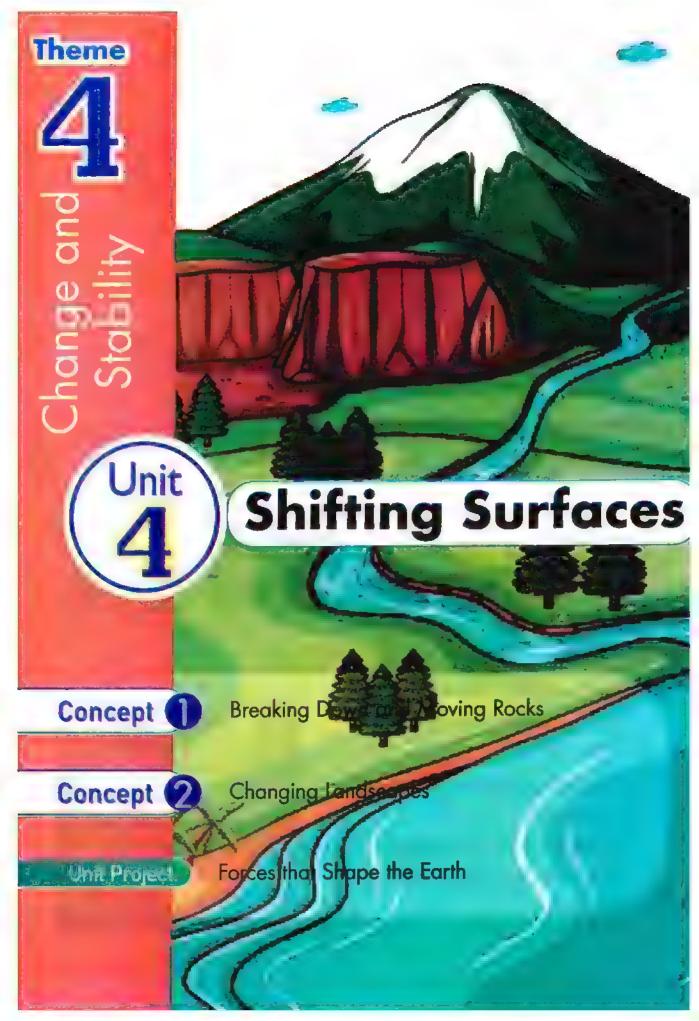
| (1) | *************************************** | en | er | g |
|-------|---|------|------|---|
| (at t | he t | ор | of c | 7 |
| W | ate | fall |) | |



kinetic energy. which rotates the ___(2)___

| | is | |
|----|--------|---|
| CO | nverte | d |
| A. | into | 2 |
| | | |

(3) energy (produced harmale generator)



Get Started What I Already Know

How does the Earth's surface change



>> The Earth's surface is always changing.

Many factors can change the Earth's surface, which are:



>> Many of the Earth's landforms take millions of years to form, such as:

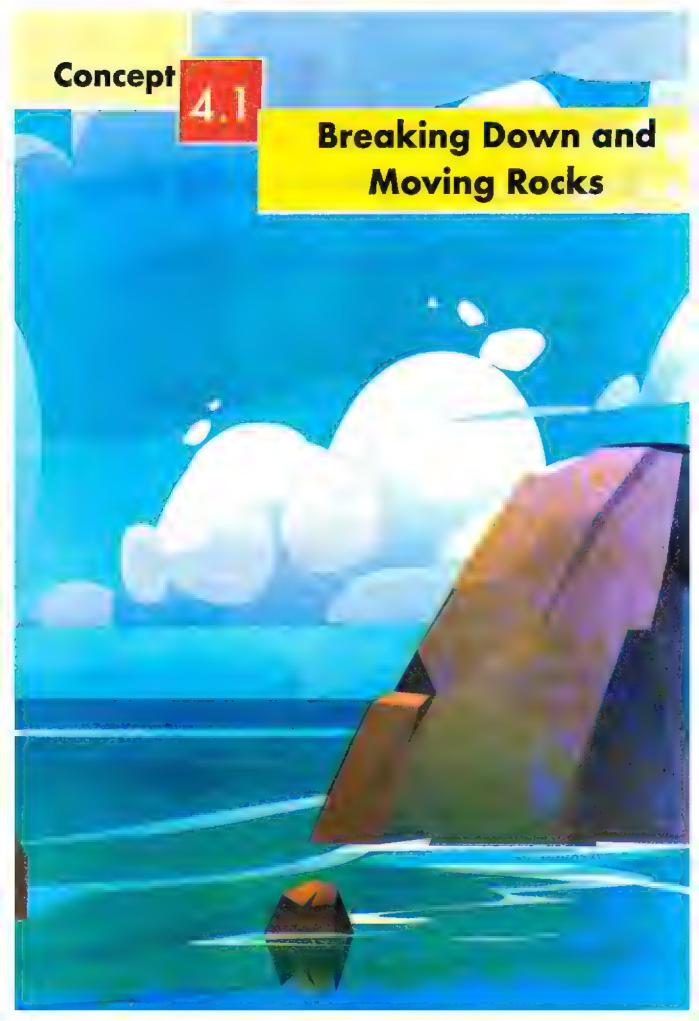


Wadi Nakhr

- The image represents

 a canyon called Wadi Nakhr
 in Oman.
 - This canyon may be formed in a very long time.
- Water, wind, and other factors help in the formation of this amazing landscape.





Concept

Breaking Down and Moving Rocks

| Lesson 1 | |
|--|--|
| Can You Explain? | |
| Disappearing Sandcastles | |
| Sandcastles, Rocks, and Canyons | |
| Lesson 2 | |
| What Do You Already Know About Breaking Down and Moving Rocks? | |
| What Is Weathering? | |
| Types of Weathering | |
| Lesson J | |
| Modeling Mechanical and Chemical Weathering | |
| Weathering | |
| Liesson 4 | |
| Erosion | |
| Deposition | |
| Lesson 5 | |
| E : L COL | |
| Evidence of Change | |
| | |

Glossary

| , | · · · · · · · · · · · · · · · · · · · | Lesson | (1) | The second secon | V7 V V + M + M + M |
|--|--|--------------------|---------------------------|--|---------------------|
| Activi | tv 4 | | | | |
| Break down | تكسير | Weather change | تغیرات مناخیة ۵ | Landscapes | مظايّة ر السطح |
| Activi | v 2 | | | | 4 |
| Wind blows | تهب الرياح | Wear away rocks | تفتيت الصخور S | Weathering | النجرية |
| Sand dunes | الكائبان الرملية | Footprints | أثار الأقدام | | قيلى قعلة |
| Collision | تصايم | Coastal rocks | المنقون الساطية | 4 5 72 64 5 5 5 5 5 5 | 7 t 40 T |
| Activit | V-3 | | | | |
| Canyon | الأخدري | Steep | منحبرة | Needle | الإبر |
| And the state of t | The state of the s | Lesson | (2) | the ten the same of the same | n G Zoper F |
| Activit | VA. | | | | |
| Erosion | التعرية | Deposition | الترسيب | | |
| Activit | у -Б | | | _ | |
| Statue | تمثال | Peeling | تقشير | | |
| Activit | v-Granification | | | | |
| Pebbles | حصى | Lichens | الأشتات 🦠 💮 | Rushing water | ماء مندقع |
| Rust | صنأ | Element | عتصر | Evidence | ىلىل |
| Enormous | شخم | Sand rushes | اندفاع الرمل | Limestone | المجر الجيري |
| Boulder | محفرة كبيرة | Dissolve | تنوب | Cave | كهف |
| | | Lesson | (3) | | Art. S. |
| Le Activities | | | | | |
| Antacia tablet الم | قرص مضاد للحمو | | يتعرض ال | | |
| , 500 MARCAN | 47.1 | Lessons (4 | and 5) | | |
| Activity Erode | | Donah | . 1.10 | Danasitian | |
| Farmlands | | Beach Flash floods | شاطئ الفیضانات المفاجۂ | Deposition Hurricanes | الترسيب الأعاصير |
| Landslides | الانهيارات الأرضية | Flash floods | استصادت استفدا | Horricaries | الاعاصين |
| Activity | | | | | |
| Sediment | | Mud - | طين | Remains | بقايا |
| | | Western Desert | الصمراء القربية | Peninsula | |
| Settling | استقرار | western besert | ا الصحوراء العربية | Peninsula | شبه جزيرة |

Activity 1 Can You Explain?

The Earth's surface is always changing due to the effect of wind, water, and weather changes.

« تتغيِّر مظاهر سطح الأرض باستمرار؛ بسبب العديد من العوامل مثل: الرياح، وإلماء، وعوامل الطقس.

For Example:

Wind can break down rocks and move small particles of rocks from one place to another.

• يمكن للرياح أن تُفتُّد الصغور وتتقل جزيئات الصغور الصغية من مكان إلى آخر.



Water can break down rocks and change their shapes.

ويمكن للمياه أن تُسبِّب تفتيت الصخور وتغيير شكلها.





Evaluate Your Learning!

- >> Correct the underlined words:
 - The Earth's surface is stable as time passes.

Wind and water can change the moon's surface.

| 1 | | | | | | | | 1 |
|---|------|---|----|---|------|-----|-----|---|
| ľ | | m | 71 | ч | - 11 | lp= | 784 | |
| | | | | | | | | |

- Give a reason for:
 - The Earth's surface is always changing.

Activity 2 > Disappearing Sandcastles

Adam is on vacation with his family. He plays in the sand, swims in the sea, and builds sandcastles with his sister.



>> Look at the two pictures, and tick the correct answer.

Will the footprints of Adam and sandcastle still be there tomorrow?







Natural Erosion

- >>> When the child builds a sandcastle on the beach, it might disappear after a few hours.
- The sandcastle disappears because water and wind carry away the sand. This is an example of natural erosion.



NOTES

- The movement of the water waves causes erosion of the beach. over time.
- Sand particles are formed from the breakdown of rocks.

حركة الأمواج تؤدي إلى تأكل الشاطئ مع مرور الوقت.
 ب تتكون جزيئات الرمل من تفتت الصخور.



Evaluate Your Learning!

Put (/) or (/):

- Water and wind can move small rocks from one place to another.
- The disappearance of your footprints in the sand takes a long time.

Activity 3 Sandcastles, Rocks, and Canyons

Put (√) or (X):

朱

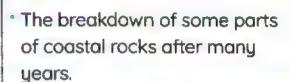
- The disappearance of your footprints in the sand is a fast change.
- The Earth's surface changes from time to time.
- The Earth's surface is always changing over time.

Some changes are very fast,

Some changes are very slow.

Such as:

* The disappearance of a sandcastle when water waves hit it after few minutes.







Similarities between sandcastles and coastal rocks:

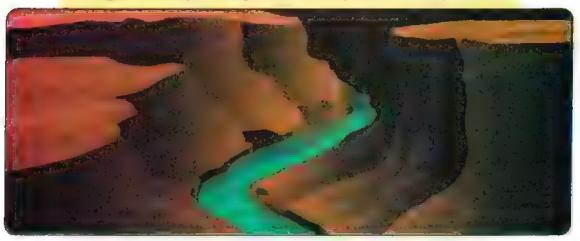
- Both have steep needle-like parts and sloping sides at the bottom.
- They are formed by the effect of water and wind.

أوجه انتشابه بين القلاع الرملية والصخور الساحلية:

- بحتوى كلاهما على أجزاء حادة تشبه الإير وجوانب مائلة في الأسفل.
 - يتشكُّلان يقعل الماء والرياح.



They are deep valleys carved by the flowing water.



Shape:

A canyon has steep needle-like parts and slopes at the sides.

Time of Formation:

· A canyon takes millions of years to be formed.

Way of Formation:

A canyon is formed by the action of water.

- الشكل: يمتوي الأخدود على أجزاء هادة تشبه الإبر ومنعدرات عن الجانبين.
 - الوقت اللازم نتكونه: يستغرق تكوين الأخدود العديد من السنين.
 - طريقه تكونه: بتشكل الأخدود بفعل المياه.

Evaluate Your Learning!

>>> Put (\(\sigma \)) or (\(\sigma \)):

| The disappearance of the sandcastle is a slow change. | |) |
|---|--|---|
|---|--|---|

A canyon may be formed in a very short period of time. ()

| Canuons | are carved by the flowing we | ater. | 1 |
|-----------|------------------------------|-------|---|
| Carigoria | die cai rea by the noming m | atci. | 1 |

Exercises on Lesson 1

| | | | • |
|---------------------|-------------------|---------------------|---------------------|
| 1. Choose the corre | ect answer: | | |
| (i) can chan | ge the shape of | the Earth's surfac | e. |
| a. Water | b. Wind | c. Weather | d. All the previous |
| 2 All the following | are landscapes t | that have change | d over a long time |
| except | | | |
| a. canyons | b. sandcastles | c. coastal rocks | d. mountains |
| As a result of the | breakdown of $_$ | , sand is f | ormed. (Alex. 2024 |
| a. rubber | b. plastic | c. rocks | d. glass |
| Rocks can be bro | oken down into s | small particles by | the exposure to a |
| the following, exc | ept | | (Aswan 2023 |
| a. water waves | b. rain water | c. moonlight | d. wind |
| 5) Sandcastles will | after one | day. | |
| a. be the same | | b. become stro | nger |
| c. disappear con | npletely | d. be partially a | affected |
| 6 are dec | ep narrow valley | s with slopes at th | neir sides. |
| a. Hills | b. Sand dunes | c. Canyons | d. Mountains |
| A canyon may to | ake many | to be formed. | (Suez 2023 |
| a. minutes | b. hours | c. days | d. years |
| 2. Put (/) or (X): | | | |
| 🕦 Sea waves may | cause the erosio | n of beaches. | (Alex. 2024) (|
| The formation of | canyons is cons | sidered a rapid ch | ange of the Earth' |
| surface. | | | (|
| Strong winds car | n break down roo | cks and form diffe | erent landscapes. |

| E |
|---------|
| Concept |
| - |

| | When a part of a sandcastle disappears due to the effect of sea wave |
|---|--|
| | its volume and shape change. (|
| | 6 Coastal rocks have sloping sides at the bottom. (|
| | The Earth's surface changes from time to time. (Cairo 2023) (|
| | All changes to the Earth's surface take hundreds of years. |
| | [Alex. 2023] (|
| | (Red Sea 2024) (|
| | The Earth's surface never changes. (Suez 2023) (|
| | Water and wind are natural factors that cause the change of the Earth' |
| | surface, · (|
| (| 23. Write the scientific term: |
| | ① It is a natural factor by which canyons are carved. |
| | it is a deep valley with steep sides. (Cairo 2023) (|
| C | 24. Correct the underlined words: |
| | 1 The origin of sand is the breaking down of glass. |
| | ② Gravity can change the shapes of canyons. |
| | A sandcastle becomes stronger after being hit by waves.(|
| | The shape of a canyon has changed over a short period of time. |
| | (************************************* |
| G | 1 25. Complete the following sentences using the words between the |
| | brackets: |
| | (quickly - wind - very slowly - rocks - water - canyons) |
| | Sand is formed due to the breakdown of (Giza 2024 |
| | 2 Sandcastles' shapes change, while canyons' shapes |
| | change |
| | The shape of coastal rocks is affected by the forces of |
| | and |
| | The deep narrow valleys with sloping sides are called |
| | |

Q6. Study the following figures, then complete the sentences below







Figure 1



Figure 2

Figure (3)

- 1 The landform in figure (____) has steep parts and sloping sides.
- 2 The landform in figures (____) and (____) are changed very slowly, while that in figure (.....) is changed very quickly.
- 3 After many hours, the landform in figure (____) will completely disappear.

Q7. Give reasons for:

- The Earth's surface is always changing.
- 2 A sandcastle completely disappears after a short period of time.

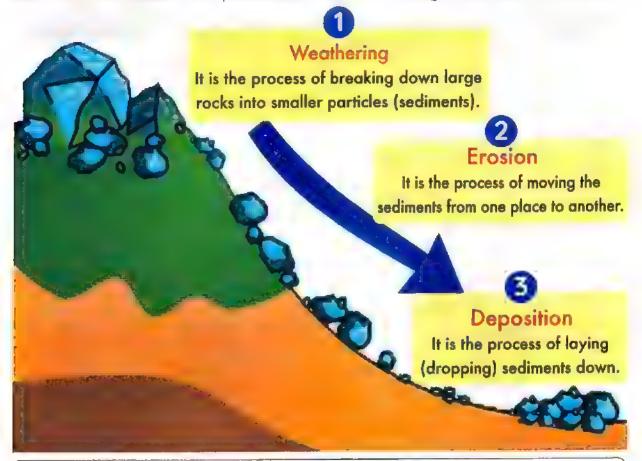
Q8. What happens if:

Waves of seawater hit your sandcastle?

Lesson

What Do You Aiready Know About Activity **Breaking Down and Moving Rocks?**

>> There are three main processes that can change the Earth's surface.



يوجد ثلاث عمليات رئيسية قد تتسبُّب في تغيير مظاهر سطح الأرض:

- 🚹 عملية التجوية: تكسير وتفتيت الصخور الضخمة إلى قطع صغيرة (رواسب).
 - [2] عملية التعرية: نقل فُتات الصخور أو التربة من مكان لأخر.
 - (3) عملية الترسيب: إرساء الرواسب في الأسفل.

NOTES

- Sediments could be sand, rocks, or soil.
- The type of sediment depends on the environment where the weathering process occurs.



5 What is Weathering?

- Many weather conditions, such as wind, rain, and temperature, may cause weathering.
- Weather and weathering are different, where:

Weather

Weathering



 It is the condition of the atmosphere at a specific place and time.

الطقس: هو حالة الجو في مكان معين ووقت معين.

 It is the process of breaking down rocks into small (tiny) particles.

التحوية: هي عملية تغتَّت الصخور إلى قِطْع صغيرة.

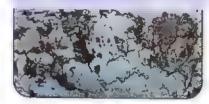
Weathering may cause



the breakdown of statues.



The peeling of paint on buildings.



Knowing the weather helps us decide what to wear when we go outside.

ا يساعدنا معرفة حالة الطقس على تقرير ما سنقوم بارتدائه خارجًا.



Evaluate Your Learning!

>>> Put (\(\sigma \)) or (\(\times \):

- Weathering can change the shape of landscapes over time. (
- Weathering is the condition of the atmosphere in a specific place.

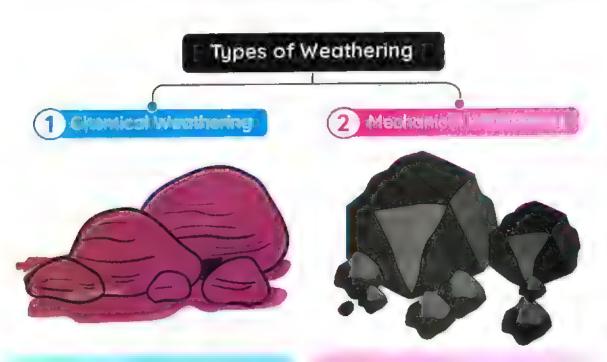
4

Activity 6 Tupes of Weathering

- >>> Weathering is one of the factors that change the Earth's surface.
- If you have seen rocks of different sizes, this is an evidence of weathering.



- تُعتبر التجوية من العمليات التي تُفيِّر سطح الأرض.
- إذا رأيت صحورًا ذات أحجام مختلفة؛ فهذا بليل على عملية التجرية.
- نتسبَّب التجوية في تكشر الصخور الكبيرة (المُكوّنة للجبال) إلى حصى (صخور أصغر) إلى أن تصبح رمالًا.



It is the process of breaking down rocks with a change in their structure due to chemical reactions.

عملية تفتَّت الصخور مع تغيير تركيبها؛ بسبب التفاعلات الكيميائية.

It is the process of breaking down rocks without a change in their structure due to physical factors.

عملية تفتُّت الصخور بدون تغيير تركيبها؛ بسبب العوامل الفيزيائية.

Chemical Weathering

It is the change in the structure of rocks due to chemical reactions.

التجوية الكيميائية مي التغيُّر الذي يحدث لتركيب الصخور بسبب التفاعلات الكيميائية.

Factors of Chemical Weathering









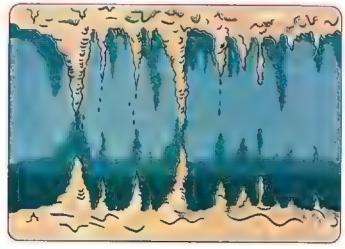


1 Water:

- Water dissolves some minerals in rocks.
- Dissolved minerals combine again to form new shapes, such as in limestone caves.

يتسبُّب جريان المياه على الصحور في:

- « تتسبب المياه في دومان بعض المعادن المُكرُنة لهذه الصخور.
- تتحد أجزاء الصخور امذابة مع مواد أخرى؛ لتُكوِّن أشكالًا جديدة، كما في كهوف الحجر الجيرى.
- Most caves are formed due to this type of chemical weathering.



2 Oxygen Gas:

 Oxygen in the air reacts with the iron found in some rocks, forming red-colored rust.



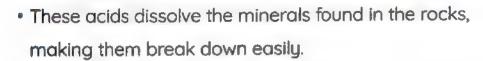
This reaction also weakens rocks, causing them to break down easily.

• يتفاعل الأكسجين المرجود في الهواء مع الحديد المُكرِّن لبعض الصخور مُكوِّنًا صدأ أحمر اللهن.

بنسبِّب هذا التفاعل في إضعاف تماسك الصخور وتعبَّتُها بسهولة.

3 Acids Produced by Lichens:

- Lichens are tiny plant-like organisms.
- They produce acids on rocks as they grow.





تنتج الأشنات أحماضًا على الصخور أثناء نموها.

ه تعمن الأحماض عن إذابة المعادن الكونة للصخور؛ مما يتسبُّب في تكسير الصخور ،

4 Acid Rain:

 Acid rain can also dissolve the minerals found in the rocks, causing them to break down easily.

• يمكن للأمطار الحمضية أيضًا أن تُسبِّب إنابة المعادن المُكرِّنة للصخور؛ مما يتسبب في تكسير الصخور يسهولة.





1

التجوية الميكانيكية: هي عملية تفتُّت الصحور بسبب تأثير العوامل الفيزيائية.

Factors for Mechanical Weathering 3 Temperature Wind Water Plant Roots

1 Temperature:

- Water and temperature work together to break rocks.
- Water flows into the tiny cracks in the rocks.
 - When the temperature becomes very cold,
- water freezes, forming ice that expands, so the cracks become wider.
- When the temperature increases, ice melts, and water fills the newly formed cracks again.
- The cycle of melting and freezing continues until rocks are broken down.







The word "Expand" means increase in size (volume)

- يتسلل الماء ويتغلغل داخن شقوق الصخور الدقيقة.
- [2] عند انخفاض درجة الحرارة ينجمد للاء ويتمدد داخل الشقوق؛ مما يتسبب في انساع هذه الشقوق أكثر.
 - عند ارتفاع درجة الحرارة ينصهر التلج وتملأ المياه الشقوق الجديدة التي تكونت.
 - [4] تستمر دورة الانصهار والتجمُّد إلى أن تنكسر الصخور.

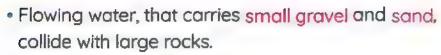
2 Wind:

- Sand and wind wear down large rocks.
 - 1 Wind pushes sand on the rocks' surface.
 - 2 Friction occurs between the sand and the rocks.
 - 3 This causes the rocks to smooth out and break down.



- 🚹 تقوم الرياح بدفع الرمال على أسطح الصحور.
 - 2 تحدث قوة احتكاك بين الرمال والصغور.
- [3] تتسبُّب تلك القوة في صقل الصخور وتفتتها.

3 Water:





· Large rocks are broken down and their rough edges become smooth.

المياه المندفعة «الجارية»:

- تمثليُّ المياه الجارية بقطع صغيرة من الحصى والرمل، والتي تصطدم بالصفور الكبيرة.
 - ه تتفتُّت الصخور الكبيرة وتصبح حوافها الخشنة ناعمة.

Plant Roots:

- 1 Plant roots grow inside the cracks of rocks.
- 2 The cracks become wider.
- 3 The rocks are broken down.



جذور الأشجار:

- 🚺 تنمو جذور النباتات في شقوق الصخور.
 - 2] يتسبُّب ذلك في اتساع الشقرق،
 - [3] تتفتَّت الصخور.

器

We can see the effects of weathering all around us in the little rocks, pebbles, and sand, which were once part of much larger rocks.



It is hard to see weathering in action.

Because weathering happens over long periods of time.

| P.O.C | Chemical Weathering | Mechanical Weathering | | |
|---------------------|--|---|--|--|
| Definition | It is the change in the structure of rocks due to chemical reactions. التجوية الكيميائية: هي التغير الذي يحدث لتركيب الشاعلات الكيميائية. | It is the breakdown of rocks due to the effect of physical factors. التجوية الميكانيكية: هي عملية نفتت الصخور بسبب تأثير العوامل الغيزيائية. | | |
| Reason (Factors) | Water Oxygen gas Acids produced by lichens Acid rain | Temperature Wind Water Plant roots | | |

Classify the following situations by writing the letters (M) for mechanical weathering and (C) for chemical weathering: Water freezes inside the cracks of the rocks. Formation of limestone caves. Rushing water causes rocks to become smooth. Plant roots grow inside the cracks of the rocks. The red-colored rust is formed on a rock.

Exercises on Lesson

Q1. Choose the correct answer:

| 1 | Dropping of se | diments in a new | place is known | as (Minia 2023 |
|------|-------------------------|-----------------------------|--------------------|----------------------|
| | a, deposition | b. weathering | c. erosion | d, freezing |
| 2 | The existence o | f rocks in differen | t sizes is an evi | dence of |
| | a, melting | b. weathering | c. erosion | d. deposition |
| 3 | The w | veathering is a ch | ange in the stru | icture of rocks. |
| | a. pnysical | | b. chemical | |
| | c. mechanical | | d. electrical | (Fayoum 2024 |
| 4 | The movement | of sediments fron | n one place to | another represents |
| | the pr | ocess. | | (Damietta 2024 |
| | a. weathering | b. deposition | c. erosion | d. photosynthesis |
| ୍ଦ୍ର | Plant | play an importan | it role in the me | echanical weathering |
| | process. | | | |
| | a , leaves | b. stems | c. roots | d.flowers |
| 6 | All the following | are reasons for c | hemical weath | ering, except |
| | a. water | b. plant roots | c. acid rain | d. oxygen gas |
| 7 | may o | cause chemical or | mechanical w | eathering. |
| | a. Lichens | b. Oxygen | c. Water | d. Plants' roots |
| 8 | produ | ce acids as they g | grow on the roo | cks. |
| | a. Insects | b. Plants' roots | c. Beetles | d. Lichens |
| 9 | Which of the following | owing examples r | represents mec | hanical weathering? |
| | a. The red-color | ed rust on rocks. | b. Acid rain fa | lls on rocks. |
| | c. Roots grow in | side cracks of roc | cks. | |
| | d. Formation of | limestone caves. | | |
| 10 | and . | cause ch | emical weather | ring. |
| | a. Lichens – plar | nts' roots | b. Acid rain - c | oxygen |
| | c. Water – plant | roots | d. Water - win | d |
| | | | | |

| (| 44 |
|------|----|
| | |
| | |
| | 9 |
| 12 | i. |
| - 26 | Ľ. |

| Till Limestone caves are formed due to the combination of | | | | |
|--|---------------------------------------|--|--|--|
| dissolved minerals | b. insoluble minerals | | | |
| c. red-colored rust | d. acid rains (Cairo 2023) | | | |
| 12 The iron that makes up rock mine | erals rusts when it is exposed | | | |
| ale and serve remaintener remarker in contract of the contract | | | | |
| a. chemical weathering | b. mechanical weathering | | | |
| c. erosion | d. deposition (Red Sea 2024) | | | |
| 33 Dissolving minerals of rocks and | recombining them with new | | | |
| substances is an example of | | | | |
| mechanical weathering | b. weathering by wind | | | |
| c. chemical weathering | d. erosion (School Book) | | | |
| 14 All the following are processes the | at change the Earth's surface, except | | | |
| and the second of the second o | (Cairo 2023) | | | |
| a. erosion b. digestion | | | | |
| 15 Lichens produce that di | | | | |
| | c. water d. acids (Suez 2023) | | | |
| | uding temperature, wind, and rain is | | | |
| known as | (Suez 2023) | | | |
| a. weathering b. weather | c. erosion d. deposition | | | |
| 22. Put (/) or (X): | | | | |
| The deposition process takes place | ce before the erosion process. () | | | |
| 2 We can see weathering in action | everywhere around us. () | | | |
| '3 Weathering is the condition of a | atmosphere in a specific place and | | | |
| time. | () | | | |
| '4 The Earth's surface changes | through weathering, erosion, and | | | |
| deposition processes. | (Red Sea 2024) () | | | |
| 5 Limestone caves are formed as a | result of mechanical weathering. | | | |
| | (Shark a 2024) () | | | |
| 6 When water freezes inside the cr | acks of a rock, its volume increases | | | |
| causing these cracks to become | wider. () | | | |

| | The breaking of statues are evidence of the deposition process. (|
|----|---|
| | (8 The roots of trees can make rocks break down. (Beheira 2024) (|
| | Rocks become stronger when the iron found in them rusts. |
| | (Suez 2023) (|
| | Wind can be considered one of the factors that causes weathering |
| | (Port Said 2024) (|
| | 11 Weathering may occur due to the collision (friction) between rocks |
| | and sand carried by the wind. (|
| | Q3. Correct the underlined words: |
| | 1 Growing roots inside a rock causes chemical weathering. |
| | (Alex. 2024) |
| | When oxygen reacts with the iron in rocks, a green-colored rust is |
| | formed. (Cairo 2024) (|
| | The stems of plants grow inside the cracks of rocks, causing them to |
| | break down. |
| | Carbon dioxide rusting of the iron found in rocks. |
| | Limestone caves were formed due to mechanical weathering. |
| | |
| | As plants' roots grow inside rocks, the cracks become narrower. |
| | (|
| | |
| | Q4. Complete the following sentences using the words between the |
| | brackets: |
| | (mechanical - increases - chemical - oxygen - minerals - |
| | iron – acid rains) |
| | 1) The dissolve the minerals found in rocks. (Alex. 2024) |
| | 2 Lichens produce acids on rocks, which dissolve its |
| | (Behiera 2023) |
| | When water freezes, its volume (Damietta 2024) |
| | weathering and weathering are types of weathering. |
| | When the in the air reacts with the found in rocks, |
| | a red-colored rust is formed. |
| -1 | |

| Shif | ting, Surfaces | |
|------|---|---|
| Q5. | Write the scientific to | erm: |
| 1 | It is the process of movin | g rocks from one place to another.(|
| 2 | It is the process in whi | ich rocks are broken down into smaller particles (Alex. 2024) (|
| 3 | It is the process of lay happened. | ing down sediments in a new place after erosion |
| 4 | It is the kind of weather and temperature. | ering that takes place by the effect of water |
| 5 | It is the kind of weat rocks. | hering that changes the structure and color of (Qalyubia 2023) (|
| 6 | | ike organisms that live on rocks and produce the rocks. (Beheiro 2024) |
| 7 | _ | that combines with the iron in some rocks and s. (Dakahlia 2023) (|
| 8 | They are parts of the parts of | plant that break down rocks as they grow through |
| 9 | They are types of car minerals of rocks. | ves formed due to the combination of dissolver |
| 10 | 2.7 | cks that reacts with oxygen, forming red-colored |
| Q6. | | (A) what suits it in column (B): |
| | Column (A) | Column (B) |

| Column (A) | Column | Column (B) a. produce acids that dissolve the minerals of rocks. | |
|------------|-------------------------|---|--|
| 1 Lichens | | | |
| 2. Water | b. can rust rocks. | (Fayoum 2024) | |
| 3 Oxygen | c. may cause both types | of weathering. | |

1 2 31

A red-colored rust is formed on some rocks?

5 The lichens growing on rocks produce acids?

(Ca ro 2024)

(Beheira 2024)

(Dakahlia 2023)

(Alex. 2023)

6: Plant roots grow inside rocks' cracks?

4 Acid rain falls on rocks?

Lesson 3

Activity



Modeling Mechanical and Chemical Weatherina

- Scientists use models to understand weathering because it is hard to see weathering as it takes a very long time to occur.
- In this activity, we will make two models for mechanical and chemical weathering.
 - يُستخدم العلماء النماذج لفهم التجوية؛ لأنه من الصعب رؤيتها؛ لأنها تستغرق وفتًا طويلًا حتى تحدث.
 - في هذا النشاط، سنقوم بعمل نموذجين للتجوية الميكانيكية والتجوية الكيميائية.

Tools



Two pieces of biscuits



A piece of cloth



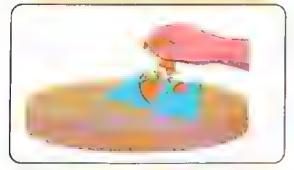
A cup of water



Antacid tablets

Stepsi

A model of mechanical weathering



Trush a piece of biscuit with your hand on the piece of cloth.

A model of chemical weathering



Place a piece of biscuit in the cup, then add water and antacid tablets to it.

In the model of mechanical weathering:

The biscuit is broken into small pieces, but it is still the same material.

In the model of chemical weathering:

A completely different new substance, dough, is formed.

*Conclusion:

Both mechanical and chemical weathering break down rocks into smaller parts.

Chemical Weathering

It forms a completely new substance. Causes a greater change to the substance than

Mechanical Weathering

It doesn't change the substance.



Evaluate Your Learning!

▶ Put (✓) or (✗):

- 1 Scientists use models of weathering because it is hard to see weathering in real life.
- 2 The weathering process usually takes a short time to happen.
- 3 Mechanical weathering always produces a new substance. ()
- Water may cause mechanical weathering or chemical weathering.

(

)

Activity 8 Weathering

>> Study the following figures, then classify them by writing letters (M) for mechanical weathering and (C) for chemical weathering:















| | CXGI | CISES | OH | Lesson | 3 |
|-----|------|-------|----|--------|---|
| | | | | | |
| O 1 | - 1 | _ | | | |

| 1. Choose the correct answer: | | |
|--|-------------------------|-------------------|
| Breaking a piece of biscuit by your | hands is similar to the | of rock |
| a. mechanical weathering | b. chemical wea | thering |
| c. erosion | d. deposition | (Gharbiya 202 |
| ② has the same effect | of chemical weath | ering of rocks. |
| a. Cutting vegetables to make s | alad | |
| b. Adding an antacid tablet and | water to biscuit | |
| c. Breaking down a glass by a h | ammer | |
| d. Dividing a loaf of bread by a | knife | |
| The process of breaking rocks ar | nd eroding them by | acids is called |
| #10 file ris | | (Menoufia 202 |
| a. erosion | | |
| b. chemical weathering | | |
| c. mechanical weathering | | |
| d. deposition | 5.1 | |
| Rusting of a statue is an example | | |
| a. deposition | b. erosion | (Menoufia 202 |
| c. mechanical weathering | | |
| The process of breaking down re | ocks of the Earth's s | surface is called |
| 44404404dalatradam vanda delm termelmanası → | | |
| | c. decomposition | |
| When acid rain falls on a building | g, all the following n | nay occur to this |
| building, except | | |
| a. chemical weathering | | |
| b. a change in the paint color | | |
| c.a change in its rocks structure | 9 | |
| d. mechanical weathering | | |

| | | |) |
|-----|--------------------------------------|--|--------|
| 7 | Which of the following does not car | use mechanical weathering? | |
| | 27 | (Damietto | 2024) |
| | a. Roots of plants | b. Wind movement | |
| | c. Acid rains | d. Water movement | |
| 22. | Put (✓) or (X): | | |
| 1 | Chemical weathering causes greate | er changes than mechanical | |
| | weathering. | | () |
| 2 | Grinding some nuts explains the me | chanical weathering that occ | urs to |
| | rocks in nature. | | () |
| 3 | Both mechanical and chemical w | eathering processes break | down |
| | rocks into smaller pieces. | , | |
| 4 | Putting biscults in water and addin | g an antacid tablet resemble | es the |
| | effect of chemical weathering of ro | | () |
| 5 | If a rock undergoes chemical wear | thering, its size and structure | e stay |
| | the same. | 1 | () |
| 6 | Chemical weathering changes the s | structure of the rocks. | () |
| | Correct the underlined words: | | |
| 1 | When a metal statue slowly turns | green it is considered mech | anical |
| | weathering. | (|) |
| 2 | | aller nieces is a model of che | mical |
| _ | weathering. | diler pieces is a moder of ene | |
| - | Growing roots inside the cracks of a | | 651 |
| 3 | Growing roots inside the cracks of a | (| |
| | 100-1 | A minimum transfer and | |
| Т | Write the scientific term: | | |
| 1 | It is a type of weathering that occu | | |
| | formed on some rocks. | |) |
| 2 | It is the breakdown of rocks into s | maller particles without cha | nging |
| | their properties. | (Assiut 2023) (| |
| | | | |

| | L | | | |
|---|----|---|---|--|
| , | Ò. | | | |
| | | , | 1 | |
| | 1 | | | |
| | = | • | L | |

Q5. Complete the following sentences using the words between the brackets:

| | (weathering - chemical - structure - wind - mechanical) |
|----|--|
| İ | The cracks in rocks caused by the freezing and melting of water are |
| | an example ofweathering. |
| 2 | Breaking down rocks into small pieces is called |
| 3 | The formation of limestone caves is an example of |
| | weathering, which causes a change in the chemical of |
| | these rocks. |
| À | doesn't cause the chemical weathering of rocks. |
| 6. | Give reasons for: |
| 1 | Crushing a biscuit into small pieces has the same effect of |
| | mechanical weathering of rocks. |
| | |
| | Half & Obstation and processing states and the contraction of the cont |
| 2 | Putting bisquits in water and adding an entacid tablet has the same |
| 2 | Putting biscuits in water and adding an antacid tablet has the same |
| 2 | Putting biscuits in water and adding an antacid tablet has the same effect of chemical weathering of rocks. |
| 2 | |
| 2 | effect of chemical weathering of rocks. |
| 2 | |
| 2 | effect of chemical weathering of rocks. |
| 2 | effect of chemical weathering of rocks. |



Once large rocks are broken down into small pieces by weathering, they are ready for another process called erosion

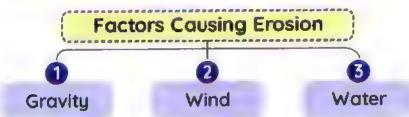


It is the process of moving small particles of sand, soil, or rocks from one place to another.

عملية التعرية:

هي العملية التي تحدث عند انتقال الجسيمات الصغيرة من الرمال أو التربة أو الصخور من مكان إل آخر.





- 1 Erosion by Gravity:
- Gravity pulls broken rocks down a mountainsides.
 - تسحب الجاذبية الأرضية الصخور من جوانب الجبال إلى أسفل.

2 Erosion by Wind:

- The wind carries sand grains from one place to another.
- Gentle winds carry sand grains for a short distance (about one meter).
- Stronger winds or hurricanes carry more sand grains over greater distances.
 - ه تُحرُّك الرياح الخفيفة حبات الرمال لمسافة قصيرة قد تكون متراً واحدًا.
- ء تحمل الرياح حبات الرمان من مكان لآخر.
- تدفع الرياح الأقوى والأعاصير قدرًا أكبر من الرمال وتنقلها إلى مكان أبعد.

17

3 Erosion by Water:

Rivers and floods carry sediments downstream.

> تحمل مداه الأنهار والفيضائات الرواسب في اتجأه مجرى النهر.

Sea waves pull sand away from beaches.

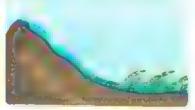
> • تقوم الأمواج بسحب الرمال من الشواطيح.

Rain washes away soil from farms located beside downhilis.

 تجرف مياه الأمطار التربة الزراعية القريبة مِن المنحدرات الجبلية.







- Sometimes you can see erosion happening, like in these cases:
 - During natural events like floods, hurricanes, or landslides.
 - · After heavy rain, you might observe small rocks being carried by the moving water
 - · When water appears muddy, indicating soil is being washed into it.

في بعض الأحيان، يمكنك أن ترى حدوث عملية التعرية كما في الحالات التالية:

- أثناء الكوارث الطبيعية مثل: الفيضائات أو الأعاصير أو الانهيارات الأرضية.
- بعد مطول أمطار غزيرة، قد تلاحظ وجود صغور صغيرة تحملها المياه المتحركة.
 - المياه الموحلة تعنى أن التربة تجرفها المياه.

Sediments

They are solid materials, such as sand, soil, and small particles of rocks, that are moved by water, wind, and gravity from one place to another, then they settle on the surface of land or the bottom of bodies of water, such as lakes.

الرواسب: هي مواد صلبة من الرمل و التربة و حزيئات صغيرة من الصخور التي يتم نقلها بواسطة الرياح و المياه و الجاذبية ثم تترسب على سطح الأرض أو في قاع السطحات المائية مثل البحيرات،



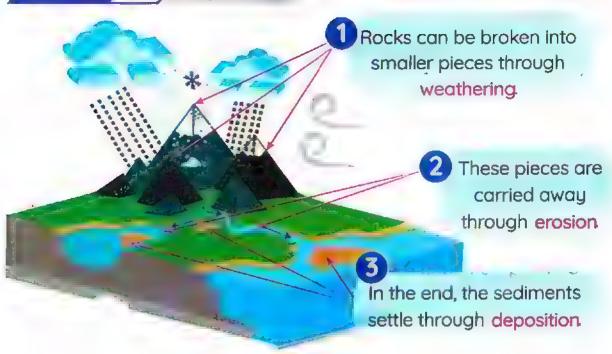
Evaluate Your Learning!

>>> Put (\(\sigma \)) or (\(\times \)):

Sometimes we can see erosion in action.

Water can play an important role in weathering and erosion.

Activity 10 Deposition



Now, let's see how deposition changes the shape of land.

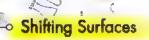
1 The role of water in deposition

- Rivers can drop sand along their banks.
- When a river carrying sediments meets a sea, these sediments are deposited, forming a delta such as Nile Delta.
 - بعمل النهر على ترسيب الرمال على طول ضفافه.
- عندما بلتقى النهر المحمل بالرواسب بالبحر، تترسب تلك الرواسب مُكوَّنة الدلتا مثل دلتا نهر النين.



Delta

It is a fan-shaped (triangle-shaped) landform that has a mass of mud and sediments formed when a river enters a large body of water.



2 The role of wind in deposition:

How does deposition occur?

- As the wind blows, it picks up sand and carries it through the air.
- 2 As the wind moves, sand travels with it.
- When the wind stops blowing, the sand falls on the ground and deposits.



- 🗻 عندما تهب الرياح، فإنها تحمل الرمال في الهواء.
 - 🔁 كلما تندرك الرياح تتدرك معها الرمال.
- [3] عندما تتوقف الرياح عن الحركة تسقط حبات الرمال وتستقر (تترسب) على الأرض.
- Strong wind can form large sand dunes, such as the sand dunes in;
 - 1 The Western Desert of Egypt.
 - 2 Rub' Al Khali in Arabian Peninsula.
- Weak wind can form small sand dunes, such as: Small dunes on a beach.

Now, we can define deposition as follows:

Deposition

It the process of laying down sediments after their erosion.

إنة سيب: هو عملية استقرار الرواسي في مكان جديد بعد تحرُّكها بفعل التعرية.

Erosion and deposition are linked processes:

If rocks become eroded,

then

they must be deposited.

2 If you see a deposit of sand

means

it has already been eroded somewhere else.

Lesson 5

Activity 11 Evidence of Change

| | Complete the following sentences using the words bank: |
|-------------|---|
| ı | weathering erosion deposition |
| | canyon sand dunes delta |
| E 1 1 | sea river strong wind weak wind sediments |
| | are small solid materials, such as sand, soil, and small pieces of rocks. |
| 2 | A delta is formed when the water of a meets the water of a |
| 3 | Sand dunes on beaches are resulted from |
| 4 | Sand dunes in the Western Desert of Egypt are resulted from |
| 5) | means laying sediments down after their erosion. |
| 6 | The process of breaking down rocks into smaller pieces is called |
| | Moving of sediments from a place to another represents the process. |
| 8 | A is a piece of land that is formed by the deposition by |
| | water. |
| 9 | A is a deep valley that is carved by water. |
| 10 | are hills of sand that are formed by the deposition by |
| | wind. |

Activity 12

Record Evidence Like a Scientist: Disappearing Sandcastles

Disappearing Sandcastles

Now, you will use your new ideas about disappearing sandcastles to write a scientific explanation that answers the Can You Explain?





Question:

How do wind, water, and weather change the Earth's surface?







Scientific Explanation with Reasoning:

2) A w reductive star view and the control of the c

Exercises on Lessons 4 and 5

| 1. Choose the cor | rect answer: | | |
|---------------------------------|-------------------|---------------------|------------------------|
| 1 The movement | of sediments fr | om one place to | another represents |
| the | process. | | (Damietta 2024 |
| a. weathering | | b.deposition | |
| c.erosion | | d.photosynth | nesis |
| 2 The force of | pulls down | broken weathere | d rocks at |
| mountainsides. | | | |
| a.the moon | b. seawater | c. rainwater | d .gravity |
| 3 Each of the follo | wing plays a role | e in the erosion pi | rocess, except |
| a. blowing wind | | b.water floods | (Qena 2023 |
| c. sunlight; | | d.Earth's gravi | ty |
| .4 is å pro | cess by which ro | cks and sedimer | nts settle after being |
| moved to a new | / place. | | |
| a. Weathering | b. Erosion | c.Deposition | d.Evaporation |
| 5 A gentle wind co | on form | | |
| a.a delta | | b.small sand d | unes |
| c.large sand du | unes | d.a mountain | |
| 6 When the river | lays the sedime | ents on a new p | lace, this process is |
| called | | | (Alex. 2024) |
| a.erosion | b.deposition | c.weathering | d.melting |
| .7 The formation of | sand dunes in the | e Western Desert | of Egypt is due to the |
| movement of | Pic | | (Port Said 2024) |
| a. floods | b.winds | c.waves | d.water |

Shifting Surfaces 8 A delta is formed by the _____ process. a. chemical weathering b. mechanical weathering deposition c. erosion (Fayoum 2024) When a river meets a sea or an ocean, a _____ is formed. volcano canyon d. delta C. mountain (Aswan 2023) Q2. Put (/) or (X): 1 The gravitational force can cause the erosion of rocks. 2 The Nile River delta has a rectangular shape. (Alex. 2024) (3 Pulling sand from seashores by sea waves is called erosion. The deposition process never changes the shape of the land. (Alex. 2023) (5 The Nile River delta is a mass of mud and other sediments. (Cairo 2023) (6 Floods are one of the factors that cause water erosion. (Alex. 2023) (7 The erosion process is usually followed by the weathering process. (Qena 2023) () 8 Gravity pulls rocks down the mountainsides, causing erosion. (Giza 2023) ((Qalyubia 2024) (9 Strong wind can form large sand dunes. 10 A dune is a hill of sand created by the wind. (Sharkia 2024) (Q3 Write the scientific term: 1 It is the process that occurs when sand, soil, or rocks are moved from

- (Fayoum 2024) (_____ one place to another.
- 2 It is an eroding factor that pulls the rocks down mountainsides.
- They are small solid materials such as sand, soil and small pieces of (Alex. 2024) (rocks.

| It is the process in which weathere | d rocks and soil are laid down or |
|---|------------------------------------|
| dropped by wind, or water. | (Dakahlia 2023) () |
| It is a triangle-shaped mass of sedim | ents formed where a river meets a |
| larger body of water, such as a sea. | (Menoufia 2023) () |
| | |
| 24. Complete the following sentence: | 5: |
| The blowing of strong | in the desert may form large |
| sand dunes. | (Cairo 2023) |
| Strong winds and hurricanes carry | for a long distance. |
| | (Ismailia 2023) |
| Gentle winds can form small | , such as those found at |
| sea beaches. | (Alex. 2023) |
| The origin of sand is the breaking defined to the same of the breaking defined to the breaking de | own of some tupes of |
| 1344 (1344) | (Giza 2023) |
| Deltas are formed by the | process. (Sharkia 2024) |
| | production (principle) |
| 5. Complete the following sentences | using the words between the |
| brackets: | |
| (water - Nile Delta - hurricane - deposi | ition - gentle wind - sand grains) |
| (A for | or a shorter distance, while |
| a carries them for a long | er distance. |
| is a fan-shaped mass of | mud and sediments. |
| Wind, and gravity are | natural factors that control the |
| erosion process. | |
| The process of laying down sedime | ents after their erosion is called |
| ************************************** | |
| | |
| | |

Shifting Surfaces

Q6. Choose from column (A) what suits it in column (B):

| Column (A) | Column (B) |
|---------------|--|
| Gentle winds | a. can form large sand dunes. |
| 2 Gravity | b. is a force that pulls down broken weathered rocks at mountainsides. |
| 3 A hurricane | c. can form small sand dunes. |

| | . 2 | (2) |
|--|--|----------------------|
| | (L) restricted to be t | tereboyassingsupodan |

Q7. Complete the table by using the process that describes the following:

(Weathering - Erosion - Deposition)

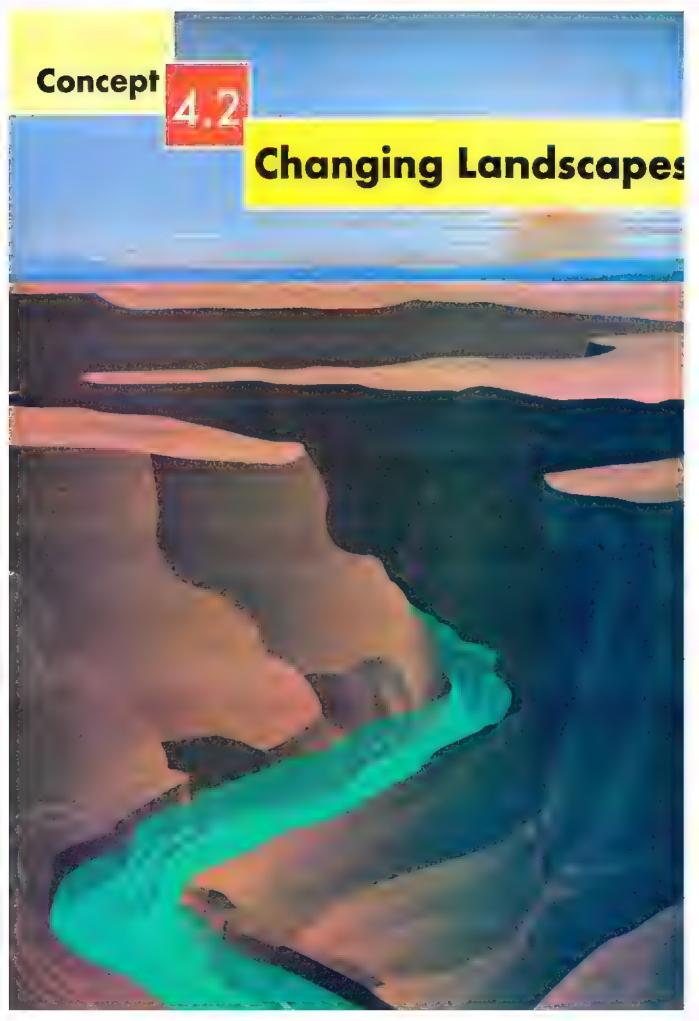
| Case | Process |
|--|---------|
| Acid rain falls on rocks. | |
| 2) A wind carrying sand stops blowing. | |
| 3 The formation of sand dunes | |
| Hurricanes and floods | |
| 5 Formation of the delta | • |
| Pulling sand from the beach | |

Q8. Give reasons for:

| T. | Gravity is one of factors that causes erosion. |
|----|--|
| | |
| | |

11

| (Gharpia 2024 |
|---|
| |
| gir hampanan maganag saga saga saga saga saga saga sag |
| |
| (Damietta 2024 |
| m if which the property of a wife in the first in minimum to the contract the contract to the |
| |
| |
| |
| |



Concept 2

Changing Landscapes

| | Lesson 1 |
|--|---|
| Activity 1 | Can You Explain? |
| Activity 2 | Canyons |
| Activity 3 | What Do You Already Know About Changing Landscapes |
| 1 | Lesson 2 |
| Activity 4 | Landscapes in Your Environment |
| | Lesson 3 |
| Activity 5 | Canyon Formation |
| Activity 6 | Canyons and Valleys |
| | Lesson 4 |
| Activity 7 | Delta Formation |
| The state of the s | Lesson 5 |
| Activity 8 | Wind Erosion |
| Activity 9 | Sand Shifters |
| Activity 10 | Describing Landforms |

Glossary

| Lesson (1) | | | | | |
|--------------------------------|--------------------|--------------|---------------|--------------------|---------------------------------------|
| (Marita) | أسيطيني | | | | · · · · · · · · · · · · · · · · · · · |
| Factors | عوامل | Impression | أثر | Evidence | ادلیل |
| Valley . | واړ . | Worn rock | صخرة متأكلة | Slope ¹ | اتصار – میل |
| Deep | عميق | | | | |
| | | Lessor | (2) | | |
| Aluin | 191.1 | | | | **** |
| Cracks | شقوق | Patch of mud | رقعة من الطين | | |
| | | Lessor | 1 (3) | | |
| Activities | 5 and 6 | | | | |
| Streams | جداول میاه | Landforms | تضاريس | Carve | ينعت |
| Steep slope | منحس شديد الاتحدار | Layers | طبقات | Sediments | بساور |
| Lowland | أرض منخفضة | Flat plain | سهل متبسط | Vertical walls | حوائط رأسية |
| | | Lesso | 1 (4) | | |
| 1 maich | | | | | |
| Silt | هلمي | Still water | مياه ساكنة | Particles | حريثات |
| Wetland | أرض رطبة | Barrier | حاجز | Fertile soil | تربة خصبة |
| | | Lesso | n (5) | | |
| Chetivities | | | | | |
| Wind direction | اتجاه الرياح | Wind force | قوة الرياح | | |

Lesson

Activity 1 Can You Explain?

>> Many factors can change the Earth's surface and form new landforms.

تساهم العديد من العوامل في تغيُّر سطح الأرض وتكوين تضاريس جديدة.

Examples of Some Landforms



Canyon



Valley

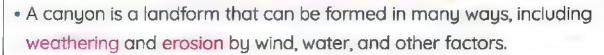


Mountains



Sand Dunes

How are canyons formed



- Canyons can take millions of years to be formed.
 - ه الأخدود من التضاريس التي يمكن أن تتكوَّن بعدة طرق، منها: التجوية والتعرية يقعل الرياح والمباه وغيرها من العوامل.
 - مستغرق تكون الأخاديد ملايين السدن.



Activity 2 Canyons

Dobserve the following figures, then put (√) or (✗):



Small Canyon in Thailand



Wadi Nakhr in Oman



Wadi Rum in Jordan



Colored Canyon in Sinai

- All canyons have the same shape and rocks colors.
- 2 Wadi Nakhr canyon has a reddish color.
- 3 The colored canyon is V-shaped.
- 4 All these canyons take a short period of time to be formed.

Canyons differ in the color, texture, and shape of their rocks.

>> You can revise your answers from the following table, which explains the similarities and differences between them:

| Landform | (n) | g-L | |
|----------------|----------------|-----------------|----------|
| Wadi Nakhr | Oman | Brown and Black | |
| Small Canyon | Thailand | Reddish | |
| Wadi Rum | Jordan | Reddish | 1 |
| Colored Canyon | Sinai in Egypt | Reddish | ✓ |

Activity

3

What Do You Already Know About Changing Landscapes?

- >>> When the water is moving over the sand:
 - · It pushes some of the sand out of the way.
 - It leaves an impression of where the water flowed.

• عندما يجري الماء على الرمال: - يقوم الماء بدفع هذه الرمال من مكانها.
- يقوم الماء أثرًا بمكان تدفَّقه.



Understanding the formation of landforms helps us predict future changes.

Formation of a Small Canyon

Observe the opposite figure, then answer:

How is the small canyon formed?

A stream of water may have formed it.

What is your evidence?

- There are trees and other plants on both sides that need water to grow.
- The sides are gently-sloped as water helps in wearing the sides down.



What happens if: It rains a lot in a small canyon?

The small canyon becomes deeper.

- كيف تكون الأخدود الصغير؟ قد يتكون الأخدى، نتيجة لجرى مائى.
 - ما هي الأدلة على تكوُّن الأخاديد بقعل للجاري للاثية؟
- وجود أشجر ونباتات على جانبَي الأخدود تحتاج إلى الماء لننمو. -جوانب الأخدود منحدرة؛ حيث تسبَّبت المياه في تآكلها.
 - إذا زادت الأمطار والمياه الجارية سيتسبُّب ذلك في زيادة عمق الأخدود الصغير.

Exercises on Lesson 1

| G | 1. Choose the corr | ect answer: | | | |
|---|-------------------------|--------------------|---------------------------------------|---|-----|
| | A canyon may to | akeof ye | ears to be formed. | (Part Said 20 |)24 |
| | a. hundreds | b. tens | c. millions | d.a couple | |
| | 2 The Colored Car | yon is found in | 75 07 No. 1 14 1 | (Sharkia 20 | 24 |
| | a. Jordan | b. Sinai | c.Oman | d. Thailand | |
| | 3 A canyon may b | e formed due to | the effect of | . (Suez 20 |)23 |
| | a. weathering or | nly | b. erosion only | | |
| | c. weathering ar | nd erosion | d. erosion and c | leposition | |
| | 4. If the rain falls ov | er a canyon for | several times per i | year, | |
| | a. its depth incre | ases | b. its depth deci | reases | |
| | c. it becomes flo | t | d, it isn't affecte | d (Port Said 20 |)23 |
| | (5) On flowing the wo | iter of a stream o | over a flat land, a | may be form | ed. |
| | a. large canyon | b. small canyo | n c.hill | d, sand dune | |
| | Reddish Small Co | anyon is found i | T 21-011-22-022-01-MEANING MAGE (. # | | |
| | a. Egypt | b. Oman | c. Jordan | d. Thailand | |
| G | 2. Put (/) or (X): | | | | |
| | The Small Canyo | on in Thailand h | as a V-shape. | (|) |
| | 2 Wadi Rum in Jor | dan is an exam | ple of a sand dune. | (|) |
| | 3 A canyon may b | e formed by we | athering only. | (|) |
| | All canyons are | similar in the sho | ape of their rocks a | nd colors. | |
| | | | (G | Palyupia 2024) (| |
| | 5 Wadi Nakhr and | Wadi Rum have | e the same color. | (| |
| G | 3. Write the scient | ific term: | | | |
| | 1) It is a deep valle | y formed due to | weathering and er | osion by wind | |
| | and water. | | | (market for a comment of the property of the | |
| | 2 It is a canyon who | se rocks have bl | ack and brown colo | rs. (|) |
| | 3 It is a canyon tha | it has a V-shape | in Egypt.(Behiera 202 | 24] (| |

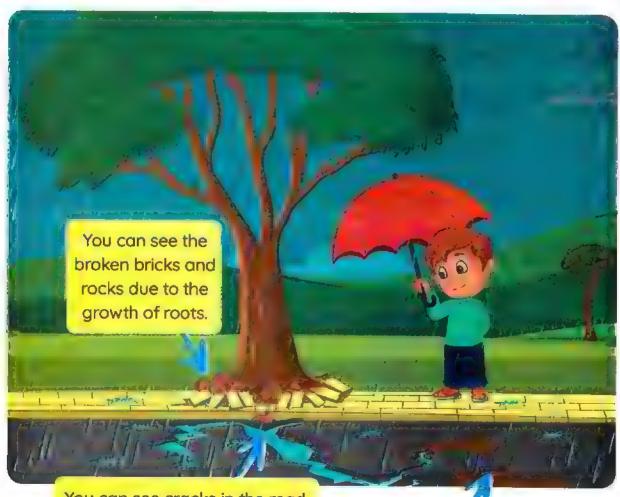
| Q4. Complete the following sentences using the words | between the |
|--|--|
| brackets: | |
| (an impression – V-shaped – water – brown and blac | k colored) |
| 1 A canyon is formed by the effect of a stream of | (A _{ex} 2024) |
| Wadi-Nakhr is acanyon. | |
| 3 Wadi Rum and the Colored Canyon in Sinai are | canyons. |
| When rain falls on a flat land of sand, it leaves | on it. |
| QS. Cross out the odd word: | |
| Mountain - Valley - Gravity - Canyon. | |
| Q6. Study the opposite figure, then | |
| complete the following sentences: | 1 |
| This figure represents a that | |
| takes of years to be formed. | The same of the sa |
| and processes | 400 |
| help In the formation of this landform. | |
| Q7. Give reasons for: | |
| 1 Trees and other plants are growing on both sides of sm | ail canyons. |
| ` | (Alex. 2023) |
| Control (Control (Con | udowo k Biologo COS haste Prop. 1940 may mba ama ka ili i indoped ell est en anna |
| Wadi Rum canyon differs from Wadi Nakhr canyon. | i |
| Q8. What happens to: | Breakh dig than grown names kreinderschilde (1948) (1979) ; j ki i slabb |
| A flat land if a water stream flows over it? | (He wan 2024) |
| 2 A small canyon if it rains a lot and water runs through it | for a longer |
| | (Gharbiya 2024) |
| N 445 inhammating management of the state of | per 14 nér labbhara saytespessessesses |

Lesson 2

Activity 4 Landscapes in Your Environment

- >>> Put (√) or (X):
 - 1 Sometimes we can see erosion happening.
 - 2 Weathering and erosion take place in a short period of time.

On a rainy day, you can see some changes in the landscape around you on the street.



You can see cracks in the road.

You can see a patch of mud.

- >> There are similarities between street landscapes and large landscapes in nature.
 - Weathering Process

Street Landscape

Instead of broken bricks and rocks due to the growth of roots,





you can see the rounded, worn rocks of mountains.





2 Erosion Process

Street Landscape

Instead of the cracks in the street.



Large Landscape in Nature

you can see that the walls of a canyon were eroded due to the effect of water.





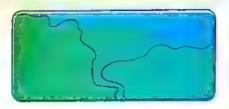
Street Landscape

Instead of a patch of mud,



Large Landscape in Nature

you can see a river making new landforms, such as a delta.





禁

Rec<mark>ognizing signs of weathering, erosion, and deposition is very useful.</mark>
Because it helps us build houses in safe places.

 People must not build a house on a hill that is eroding.



 People must not build a house very close to a river. GR

Because the river's path may change; it may cause weathering and erosion of houses.



وَيُّ فَي

Evaluate Your Learning!

| - | | | | |
|---|-----|-----|----|------|
| 2 | Put | (1) | or | (X): |

| 1 When water falls on a small canyon, it could become deeper. | () |
|--|-------|
| 2 People must build their houses close to a river. | () |
| 3 A patch of mud in a street on a rainy day represents erosion | ٦. |
| | () |
| 4 Canyons are formed by the deposition process through water. | () |
| >>> Complete: | |
| 1 Rocks get broken down by, and moved through | , and |
| dropped somewhere else through | |

when it flows on the sand.

2 Water leaves an _

Concept (2)

Exercises on Lesson 2

| 11. | Choose the correct answer: | | | | |
|-----|-------------------------------------|----------------------|---------------|--------|------|
| 1 | When large rocks of a mountain | are broken off, th | is is an evid | ence | of |
| | the process. | | | | |
| | a. deposition b. weathering | c.erosion | d. melting | g | |
| 2 | is/are evidence of dep | position. | | | |
| | a. A rounded, worn rock | b.A patch of so | and on the | grou | nd |
| | c. An area with canyons | d. Red-colored | rocks | | |
| 3 | A running water stream can transp | oort small rocks by | the | oroce | ess. |
| | a. chemical weathering | b. erosion | | | |
| | c. deposition | d. mechanical | weathering | | |
| 4 | A river may make a new | at its end through t | nep | roce | ess. |
| | a. mountain – deposition | b.canyon - erc | sion | | |
| | c. land - deposition | d. land – weath | ering | | |
| 2. | Put (✓) or (X): | | | | |
| 1 | Wnen you find a worn rock, this i | s an evidence of e | rosion. | (|) |
| 2 | Understanding the formation of | f landforms helps | us predict | : futi | Jre |
| | changes in landforms. | | | (|) |
| 3 | It is better to build your house on | a hill that is erodi | ng. | (|) |
| 4 | A river may create a delta by de | position of sedime | nts. | (|) |
| 5 | Deposition is one of the processe | es that change the | Earth's surf | face. | |
| | | | | (|) |
| 4 | A river never changes its path so | it's safe to build a | house near | a riv | /er |

| brackets: | llowing sen | ntences using the words between t |
|--------------------------|---|---------------------------------------|
| | rosion – der | position – weathering) |
| | | kdown of the sides of a mountain. |
| | | where soil was washed away after hea |
| rain is an evidenc | | |
| 3 Sediments can cr | eate a new | land over a long time by |
| | | nat suits it in column (B): |
| Column (A | | Column (B) |
| i A rounded, worn | rock | a. is an evidence of deposition. |
| 2 An area with sm | all canyons | |
| 3 A patch of sand ground | on the | c. is an evidence of weathering. |
| 1 | 3 | |
| | | |
| Give reasons for | | |
| I It is useful to reco | gnize signs | of weathering, erosion, and depositio |
| -99-90-144-944-144441 dl | F1EF133344*400400400-tab-sab-lade-sab-sab-sab-sab-sab-sab-sab-sab-sab-sab | |
| | 41.4 | close to a river. |
| 2 It is not safe to bu | ilia a nouse | |

174 Science Prim. 4 - Second Term

towards this house?



Activity 5 Canyon Formation

Many valleys, including canyons, are formed in the same way.



Stages of Canyon Formation

- Gravity pulls rainwater downhill, forming small streams.
- Small streams are joined together to form a bigger stream (river).
- The water of the river flows fast and erodes (carves out) rocks in its pathway so a valley or a canyon may be formed.

مراحل تكوين الوديان:

- 🗍 تعمل الجاذبية على سحب مياه الأمطار على طول المنصدر مُكوَّنة جداول صغيرة.
 - 2] تنجمُّع الجداول الصغيرة مُكوِّنة جداول أكبر (أنهار).
- [3] تندفع ميه النهر بسرعة وتقوم بتكسير (نحت) الصخور الموجودة في مسار النهر؛ مما يؤدي لتكوُّن الوادي والأخدود.

Factors that Affect the Shape of a Valley or a Canyon

Tupes of the rocks

Speed of the river Age of the river Size of the river

NOTES

- Big streams or rivers cause more erosion than small streams.
- Fast-moving rivers causes more erosion than slow-moving rivers.

The Grand Canyon

Location:

United States of America

Age:

It is millions of years old.

Shape:

- It is very large and steep.
- It contains many layers of rocks.
- There is a river at its bottom.



عمره: يعود تكوينه إلى ملايين السنس.

يقع في: الولايات المتحدة الأمريكية.

بعتبر أكبر أخدود في العالم.

الوصف (الشكل)؛

- هناك نهر يجري في أسفله.

- يتكوَّن من العديد من الطبقات الصخرية.

- أخدود كبير وعميق حدًا.

Formation of the Grand Canyon

Over millions of years, the water of the river was moving so quickly down a steep slope.



- 2 The force of this rushing water eroded a lot of sediments and carried them away.
- This process took many millions of years and led to the formation of the Grand Canyon.

كيف تكوَّن الأخدود العظيم؟

- 🗍 منذ ملايين السنين، كانت مياه النهر تتحرَّك بسرعة كبيرة أسفل منحدر شديد الاتحدار.
 - [2] أدَّت قرة هذه المياه للتنفقة إلى تأكل الكثير من الرواسب وحملتها المياه بعيدًا.
 - استفرقت هذه العملية ملايين السئين؛ مما أدى إلى تكوين الأخدود العظيم.

Evaluate Your Learning!

>>> Put (√) or (✗):

- 1) The bigger the stream, the more erosion it causes.
- 2 Fast-moving rivers can cause a lot of erosion.

Activity 6 Canyons and Valleys

>>> Let's study the differences and similarities between valleys and canyons.

| P.O.C | Valleys | Canyons | |
|--------------|--|--|--|
| Figure | | | |
| Definition | Valleys are lowland areas between mountains. | • Canyons are special types of valleys with steep sides. | |
| | • The sides are gently-sloped. | • The sides are steep. | |
| Differences | They are usually surrounded by a wide, flat plain. | Their walls are narrow, vertical and very high (deep). They usually consist of many layers. | |
| Similarities | They are formed by rivers or streams. They often have rivers or streams flow through their lowest points (bottoms). | | |

Evaluate Your Learning!

- >>> Put (
) or (
):
 - Canyons are a special type of valley with gently-sloped sides.
 - The walls of a valley are vertical and narrow.
 ()

Exercises on Lesson 3

| Q1. Choose the correct answer: | |
|---|---|
| _ | treams due to the downhill. |
| a. pushing force of gravity | b. pulling force of gravity |
| c. pushing force of friction | d.pulling force of friction (Minia 2023) |
| 2 can cause the greate | st erosion on its pathway. |
| | b. A slow-moving river |
| c. A river moving downhill | d. A river moving on a flat land |
| 3 When a river flows over a surface | e and carves it out, a is formed. |
| a. canyon b. delta | c. hill d. mountain |
| .4 The movement of sediments dov | wn by a fast-moving river is considered |
| a/an process. | |
| a. weathering b. erosion | c. deposition d. rusting |
| 5. All the following factors affect the | ne shape of the valley, except |
| a. the river's size | b. the river's speed |
| c. the rocks' type | d. the rocks' color (Behira 2024) |
| 6 A canyon and a valley are com | mon in having |
| a. gently-sloped sides | b. rivers at their bottoms |
| c. steep sides | d. dunes at their bottoms |
| 7 The steep valleys that are forme | ed due to the erosion of flowing water |
| are called | (Alex, 2023) |

Q2. Put (/) or (X):

a, Valleys

a. canyons

| î | When a river moves down a steep slope, its speed decreases. | (| 2 |
|---|---|---|---|
|---|---|---|---|

c. Canyons

b. sand dunes c. hills

are lowland areas with gently-sloped sides.

b. Deltas

2 Canyons are a special type of a valley. (Cairo 2024) (

3' A river can erode a mountain in a short period of time. (

4 The Grand Canyon took millions of years to be formed.

(Alex. 2024) (

d. deltas

d. Dunes

5 The Grand Canyon has a river at its bottom.

(

| It is a force that pulls rainwater downhill a mountain, forming small streams. It is a deep valley with steep sides carved by water. (Damiella 2024) (| 7 A valley has high and steep walls with many layers of rocks. (8 Both canyons and valleys often have rivers or streams that f through their lowest points. (Alex. 2024) (9 The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (10 A big stream causes more erosion than a small stream. (23. Write the scientific term: 11 It is a force that pulls rainwater downhill a mountain, forming sm streams. (2 It is a deep valley with steep sides carved by water. 2 It is the world's largest canyon, located in the USA. (3 It is the world's largest canyon, located in the USA. (4 They are often found at the bottom of both canyons and valleys. (5 It is a lowland area between mountains and has gently-sloped sides. (Shebin El-Kom 2024) (24. Complete the following sentences: 1. Rainwater is pulled downhill a mountain, forming small stream due speed , which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. | | | |
|--|---|------|--|--|
| 8 Both canyons and valleys often have rivers or streams that flow through their lowest points. (Alex. 2024) () 7 The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) () 10 A big stream causes more erosion than a small stream. () 23. Write the scientific term: 11 It is a force that pulls rainwater downhill a mountain, forming small streams. () 2 It is a deep valley with steep sides carved by water. (Damietta 2024) () 3 It is the world's largest canyon, located in the USA. () 4 They are often found at the bottom of both canyons and valleys. (Shebin El-Kom 2024) () 24. Complete the following sentences: 1 Rainwater is pulled downhill a mountain, forming small stream due to when the water of a river moves downhill a steep slope, the water speed , which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. 5 Walls of canyons are very and are composed of many of rocks. 6 Canyons have sides that are eroded by water. (Sharkia 2024) (Helwan 2024) | Both canyons and valleys often have rivers or streams that f through their lowest points. (Alex. 2024) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (A big stream causes more erosion than a small stream. (A big stream causes more erosion than a small stream. (Both ethes cientific term: (Cairo 2023) (Both ethes cientific term: (Cairo 2024) (Both ethes cientific term: (Cairo 2023) (Both ethes cientific term: (Cairo 2023) (Both ethes cientific term: (Cairo 2024) (Both ethes cientific | | | |
| through their lowest points. (Alex. 2024) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (The shape of the valley depends on the type of rocks. (Damielta 2024) (Damielta 2024) (Damielt | through their lowest points. (Alex. 2024) (The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (A big stream causes more erosion than a small stream. (3. Write the scientific term: 1. It is a force that pulls rainwater downhill a mountain, forming sm streams. 2. It is a deep valley with steep sides carved by water. (Damieta 2024) (| | | |
| 9 The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) () 10 A big stream causes more erosion than a small stream. () 23. Write the scientific term: 11 It is a force that pulls rainwater downhill a mountain, forming small streams. (| 9 The shape of the valley depends on the type of rocks existing in it. (Cairo 2023) (10 A big stream causes more erosion than a small stream. (23. Write the scientific term: 11 It is a force that pulls rainwater downhill a mountain, forming sm streams. (2 It is a deep valley with steep sides carved by water. (Damietta 2024) (3 It is the world's largest canyon, located in the USA. (4 They are often found at the bottom of both canyons and valleys. (Shebin El-Kom 2024) (24. Complete the following sentences: 1 Rainwater is pulled downhill a mountain, forming small stream due speed , which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. | flow | | |
| (Cairo 2023) () 10 A big stream causes more erosion than a small stream. () 23. Write the scientific term: 11 It is a force that pulls rainwater downhill a mountain, forming small streams. (| (Cairo 2023) (10 A big stream causes more erosion than a small stream. (23. Write the scientific term: 11 It is a force that pulls rainwater downhill a mountain, forming sm streams. (| | | |
| 30 A big stream causes more erosion than a small stream. 31 It is a force that pulls rainwater downhill a mountain, forming small streams. 32 It is a deep valley with steep sides carved by water. (Damiella 2024) (| A big stream causes more erosion than a small stream. (Q3. Write the scientific term: It is a force that pulls rainwater downhill a mountain, forming smatreams. It is a deep valley with steep sides carved by water. (Damietta 2024) (| | | |
| 1 It is a force that pulls rainwater downhill a mountain, forming small streams. 2 It is a deep valley with steep sides carved by water. (Damietta 2024) (| 1 It is a force that pulls rainwater downhill a mountain, forming smatreams. (| | | |
| 1 It is a force that pulls rainwater downhill a mountain, forming small streams. 2 It is a deep valley with steep sides carved by water. (Damietta 2024) (| the is a force that pulls rainwater downhill a mountain, forming small streams. It is a deep valley with steep sides carved by water. (Damieta 2024) (| | | |
| streams. 2 It is a deep valley with steep sides carved by water. (Damietta 2024) (| streams. 2 It is a deep valley with steep sides carved by water. (Damieta 2024) (| | | |
| 2 It is a deep valley with steep sides carved by water. (Damieta 2024) (| 2 It is a deep valley with steep sides carved by water. (Damietta 2024) (| mal. | | |
| (Damietta 2024) (| (Damietta 2024) (|) | | |
| 3 it is the world's largest canyon, located in the USA. 4 They are often found at the bottom of both canyons and valleys. (| 3 It is the world's largest canyon, located in the USA. They are often found at the bottom of both canyons and valleys. (| | | |
| They are often found at the bottom of both canyons and valleys. (| They are often found at the bottom of both canyons and valleys. (Shebin El-Kom 2024) (Complete the following sentences: 1. Rainwater is pulled downhill a mountain, forming small stream due When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3. A stream causes erosion than a river. 4. The force of rushing water erodes a lot of of a mountain and carries them away. | | | |
| (| (Shebin El-Kom 2024) (|) | | |
| Still is a lowland area between mountains and has gently-sloped sides. (Shebin El-Kom 2024) (| It is a lowland area between mountains and has gently-sloped sides. (Shebin El-Kom 2024) (| | | |
| 24. Complete the following sentences: 1. Rainwater is pulled downhill a mountain, forming small stream due to 2. When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3. A stream causes erosion than a river. 4. The force of rushing water erodes a lot of of a mountain and carries them away. 5. Walls of canyons are very and are composed of many of rocks. 6. Canyons have sides that are eroded by water. (Sharkia 2024) 7. When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | (Shebin El-Kom 2024) (| | | |
| 24. Complete the following sentences: 1. Rainwater is pulled downhill a mountain, forming small stream due to 2. When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3. A stream causes erosion than a river. 4. The force of rushing water erodes a lot of of a mountain and carries them away. 5. Walls of canyons are very and are composed of many of rocks. 6. Canyons have sides that are eroded by water. [Sharkia 2024] 7. When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | 24. Complete the following sentences: 1 Rainwater is pulled downhill a mountain, forming small stream due 2 When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. | | | |
| 1. Rainwater is pulled downhill a mountain, forming small stream due to 2. When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3. A stream causes erosion than a river. 4. The force of rushing water erodes a lot of of a mountain and carries them away. 5. Walls of canyons are very and are composed of many of rocks. 6. Canyons have sides that are eroded by water. (Sharkia 2024) 7. When the sides of a valley become steep, this valley may be changed into a | 1. Rainwater is pulled downhill a mountain, forming small stream due 2. When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3. A stream causes erosion than a river. 4. The force of rushing water erodes a lot of of a mountain, forming small stream due 2. When the water of a river moves downhill a steep slope, the water speed, which causes erosion. 3. A stream causes erosion than a river. 4. The force of rushing water erodes a lot of of a mountain, forming small stream due |) | | |
| When the water of a river moves downhill a steep slope, the water speed, which causes erosion. A stream causes erosion than a river. The force of rushing water erodes a lot of of a mountain and carries them away. Walls of canyons are very and are composed of many of rocks. Canyons have sides that are eroded by water. (Sharkia 2024) When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | When the water of a river moves downhill a steep slope, the water speed, which causes erosion. A stream causes erosion than a river. The force of rushing water erodes a lot of of a mountain and carries them away. | | | |
| speed, which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. 5 Walls of canyons are very and are composed of many of rocks. 6 Canyons have sides that are eroded by water. [Sharkia 2024] 7 When the sides of a valley become steep, this valley may be changed into a | speed, which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. | e to | | |
| speed, which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. 5 Walls of canyons are very and are composed of many of rocks. 6 Canyons have sides that are eroded by water. [Sharkia 2024] 7 When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | speed, which causes erosion. 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. | | | |
| 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. 5 Walls of canyons are very and are composed of many of rocks. 6 Canyons have sides that are eroded by water. (Sharkia 2024) 7 When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | 3 A stream causes erosion than a river. 4 The force of rushing water erodes a lot of of a mountain and carries them away. | ıter | | |
| The force of rushing water erodes a lot of of a mountain and carries them away. Swalls of canyons are very and are composed of many of rocks. Canyons have sides that are eroded by water. (Sharkia 2024) When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | The force of rushing water erodes a lot of of a mountain and carries them away. | | | |
| and carries them away. S Walls of canyons are very and are composed of many of rocks. Canyons have sides that are eroded by water. (Sharkia 2024) When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | and carries them away. | | | |
| Walls of canyons are very and are composed of many of rocks. Canyons have sides that are eroded by water. (Sharkia 2024) When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | | ain | | |
| of rocks. Canyons have sides that are eroded by water. (Sharkia 2024) When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | walls of canyons are very and are composed of mai | | | |
| Canyons have sides that are eroded by water. (Sharkia 2024) When the sides of a valley become steep, this valley may be changed into a (Helwan 2024) | r | ıny | | |
| 7 When the sides of a valley become steep, this valley may be changed into a | | | | |
| into a | | | | |
| 45 | | | | |
| Both valleys and canyons have or streams that flow at their | | | | |
| las seek seeks | | - 1 | | |
| lowest point. (Giza 2024) | lowest point. (Giza 202 | 24) | | |

Q5. Study the following figures, then put (\checkmark) or (X):





Figure (A)

Figure 3

- The landform in figure (A) has gently-sloped sides. ()
- 2 The landform in figure (B) may be surrounded by a wide and flat plain.
- Both landforms are formed due to erosion caused by rivers. ()
- The walls of the landform in figure (A) are higher than those of the landform in figure (B).

Q6. Give reasons for:

- 1. Valleys and canyons are formed in the same way.
- Rainwater is pulled downhill after falling on a mountain.

Q7. What happens if:

- 1 A river erodes the sediments of a mountain over a long period of time? (Port Said 2024)
- The water of a river moves downhill on a steep slope?



Activity 7

Delta Formation

>>> Unlike valleys and canyons, deltas are formed by the deposition process.

ه على عكس الوديان والأخاسيد، تتشكُّل الدلتا عن طريق عملية الترسيد.

How is a delta formed?

- Fast-moving rivers or streams carry sediments called silt.
- As the river water flows, it carries more and more sediments along its journey.
- When the speed of the river water decreases, it drops sediments, forming a delta.



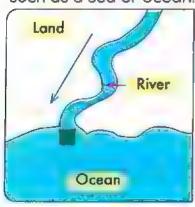
Silt is made up of very fine bits of sand, clay, or rock materials.

كيف تكونت الدلتا؟

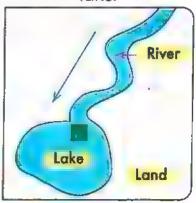
- آتحمل المياه السريعة للأنهار رواسب تُسمى الطمي.
- ᢓ عند تحرُّك النهر، فإنه يجمع الكثير من الرواسب خلال رحلته.
- [3] عندما تقل سرعة النهر، تترسُّب الرواسب التي يحملها النهر مُكرُّنة الدلتا.

The speed of a fast-moving river decreases when it enters:

Slow-moving water, such as a sea or ocean.



Still water, such as a lake.





Plants growing in the wetland of the delta help increase deposition.

Because plants' roots are responsible for slowing down the river water and trapping sediments.

تساعد نباتات الأراضي الرطبة في الدلتا في زيادة عملية الترسيب.
 حيث تقوم الجذور بإبطاء حركة المياه بشكل أكبر مما يزيد من عملية الترسيب.



Large wetlands are formed in deltas.

The Nile River Delta

"One of the most famous deltas in the world"

Shape

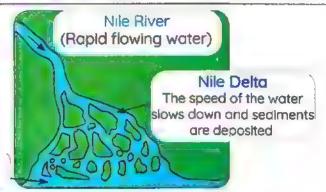
Triangular shape

Location

Lies between Cairo and the Northern Coast of Egypt.

Importance

It is characterized by the presence of fertile soil that allows the cultivation of different types of crops.



Mediterranean Sea (Slow water)

Evaluate Your Learning!

>>> Put () or ():

- 1 Canyons and deltas are landforms that were formed by the same process.
- Farmers use the infertile soil in the delta to grow many crops in Egypt.
 ()

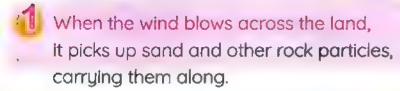
Lesson

Activity 8 Wind Erosion

>> The wind in the desert can be a powerful force for change.

تعد رياح الصحراء من القوى الأساسية في إحداث تغيير في مظاهر السطح.

Steps of Erosion by Wind



When these flying sediments hit the rocks, they wear down these rocks like a sandblaster.



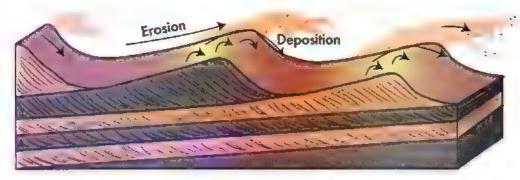
This process carves the rocks into strange shapes.

خطوات حدوث عملية التعرية بفعل الرياح:

- 📘 تحمل الرياح القريبة من سطح الأرض الرمال وجزيئات الصخور وتنقلها من مكانها لمكان آخر.
- 🙎 عند اصطدام هذه الرواسب المتطايرة بالصخور، فإنها تعمل على نحت هذه الصخور كما لو كانت آلة كشط.
 - [3] تقوم تلك العملية بتحويل الصخور إلى أشكال غريبة.

| | Sand Dunes | | | |
|----------------------|--|-----------------------------|--|--|
| Shape | A hill of sand | | | |
| Location | Sandy desert or sandy beach | Market 1 | | |
| Properties | They are found in groups.They may cover a large area. | (Hundreds of meters tall) | | |
| Are formed by | Erosion and deposition | | | |
| Factors | Wind-blown sand | | | |
| How are they formed? | They are formed when a barrie wind-blown sand. | er, like a rock, blocks the | | |

Sand Dunes Movements



- >>> Dunes are interesting because they are constantly moving, as follows:
 - When the wind blows across a dune, sand grains erode away from the side the wind is coming from.



The sand grains are carried up by the wind along the slope of the dune.



When the sand grains reach the top,

the dune forms a barrier to the wind.

So, the sand grains roll down the other side.

| الذي تأتى منه الرياح. | مال بعيدًا عن الجانب | ، تتحرك حبيبات الر | عبر الكثبان الرملية | 🗻 عندما تهب الرياح |
|-----------------------|----------------------|--------------------|---------------------|--------------------|
|-----------------------|----------------------|--------------------|---------------------|--------------------|

🔁 تحمل الرياح حبيبات الرحل على طول منحدر الكثبان الرملية.

3 عندما تصل حبيبات الرمال إلى القمة، تشكل الكثبان الرملية حاجزًا أمام الرياح؛ وبالثالي تتدحرج حبات الرمل السفل على الجانب الآخر.



Evaluate Your Learning!

>>> Put (//) or (X):

- Sand dunes are formed by the erosion process only.
 (
- Wind erosion can carve rocks into different shapes. ()

Activity 9 Sand Shifters

In this experiment, you will create a model of sand dunes and study how they move.



Stepsi

- Place a small rock on one side of the pan.
- 2 Put a suitable amount of sand on the other side of the pan.
- 3 Try to blow air on the sand using a straw.
- 4 Repeat the previous steps by changing the force and direction of the wind.

Observations:

Sand moves by the force of the wind, where:

As the force of the wind becomes weaker,

As the force of the wind becomes stronger,

the sand moves for a shorter distance.

the sand moves for a longer distance.

>> When we blow air in the same direction of the rock, the rock blocks tne sand and collects it before the rock.

Conclusions:

- >>> Dunes are often formed when something, such as a rock, blocks the path of the sand.
- >> The distance the sand grains move depends on the force of the wind.
- >> The way the sand moves depends on the direction of the wind.

Evaluate Your Learning!

>> Put (/) or (X):

- 1 The distance moved by sand depends on the direction of the wind.
- 2 Sand dunes are in continuous motion due to the movement of the wind.

Activity 10 Describing Landforms

>> Examples of some landforms that were formed:

| TP.O.6 | Fary | Line II. | Permi | Вилез |
|---------------------|---|---|--|-------------------------------|
| Figure | | | | Constitute State and |
| Definition | They are deep valleys with steep sides. | They are lowland areas between mountains that are usually surrounded by a wide, flat plain. | They are fan-shaped landforms formed when rivers enter oceans or seas. | They are hills made of sand. |
| Way of Formation | | ng and erosion er or Wind" | Deposition "Water" | Erosion and deposition "Wind" |

- >> Erosion generally occurs "slowly", but during storms or rockslides, the erosion process may occur "rapidly".
 - التعرية تحدث عمرمًا وببطء، ولكن في حالات العواصف أو الانزلاقات الصخرية، قد تحدث عملية التعرية وبسرعة».
 - Rivers cause the formation of valleys and canyons.
 - Wind and sand work together as forces of erosion in the desert.
 - الأنهار هي السئولة عادةً عن تكوُّن الوديان والأخاديد.
 - تعمل الرياح والرمال معًا كقُوى التعرية في الصحراء.

Exercises on Lessons 4 and 5

Q1. Choose the correct answer:

| ĵ. | A delta is formed when the speed | of the water of a river | phospholytopy . II |
|----|--------------------------------------|-------------------------------------|--|
| | a. stays constant | b. doesn't change | |
| | c. increases | d. decreases | |
| 2 | All the following are created by the | ne water of rivers or stream | 15 , |
| | except a | | |
| | b. delta | b. canyon | |
| | c. valley | d. sand dune | |
| 3 | The silt carried by water contains | all the following, except | ************************************** |
| | a. sand | b. clay | |
| | c. rocks | d. glass | |
| 4 | A delta is formed when the river s | tream enters all the followi | ng, except |
| | Intellibrium INCOMEDIUM II | | (Giza 2023) |
| | a, a lake | b. a sea | |
| | c. a mountain | d. an ocean | |
| 5 | The Nile River Delta has | 9 to/41064 (| |
| | a. a fertile soil | b. a triangular shape | |
| | c. an infertile soil | d. a and b | |
| 6 | A hill of sand created by wind is k | known as a | |
| | a. delta | b. mountain | |
| | c. sand dune | d. canyon | |
| 7 | The sand grains in the desert car | n move forward or backwa | rd, |
| | depending on the | | |
| | a. wind speed | b. wind direction | |
| | c. water speed . | d. water direction | |
| | | | |

Breaking Down and Moving Rocks o-

| 8 | Which of the following factors hel | ps in the formatio | n of sand d | unes? |
|------------|---|----------------------|---------------|----------|
| , | g. Water | b.Wind | | • |
| | C. Light | d. Heat | · (Cai | ro 2023) |
| ő. | When a rock blocks the path of fly | | | · |
| | a.dune | b.river | _ | |
| | c. canyon | d.delta | (Ale | x. 2023) |
| 10 | Sand dunes are formed by the eff | fect of both | proces | ses. |
| | a.mechanical weathering and de | | | |
| | b. erosion and weathering | | | |
| | c.erosion and deposition | | | |
| | d.chemical weathering and depo | sition | (Cair | o 2023) |
| Įį. | affect | the distance and | the way by | which |
| | the sand travels through the air. | 7 | (Ismaili | o 2023) |
| | a. Wind force – sunlight | b.Sunlight - win | d direction | |
| | c. Wind force - wind direction | d.Sunlight - Ear | th's gravity | |
| 2. [| Put (✓) or (X): | | | |
| 1, | The Nile River Delta has a fertile s | oil that allows the | cultivation (| of |
| | different crops. | | | () |
| 2. | A delta is formed when the speed | of the river water | increases. | |
| 3 . | Plants of wetlands and their roots | don't affect the de | eposition pr | ocess. |
| | | | | |
| 4 | The silt that is carried by a river conto | ins large bits of sa | nd and clay. | () |
| 5. | Sand dunes are formed when a ro | ck blocks a stream | n of water. | () |
| 6 | Sand dunes may be found in a sai | ndy desert or on o | a beach. | |
| Z | Sand dunes are formed by erosion | n only. | (Minia 2023) | |
| 8 | Most valleys are formed due to th | ne erosion of man | ny sediment | s and |
| • | transferring them far away. | | (Cairo 2023) | () |

| | Wind can pick up sand grains and form sand du | nes. (Port S | aid 20 |)23) |
|---|--|-----------------------|------------------------------|--------|
| | | | (|) |
| | 10 Sand dunes are stable landforms that don't move | e. | (|) |
| | 11 The formation of sand dunes in the Eastern Dese | ert of Egypt | is due | e to |
| | the movement of wind. | (Cairo 202 | (3) |) |
| | 12 Dunes are formed at the bottom of seas. | | (|) |
| | 13 Dunes are lowland areas that have gently-sloped | d sides. | | |
| | | (Port Said 202 | |) |
| | Margard Sand travels for a short distance when wind blov | vs with a gre | at for | rce, |
| | | (Gharbia 202 | 4) (|) |
| | 15 A dune is a hill of sand created by the wind. | (Sharkia 202 | (4) (|) |
| Q | 3 Write the scientific term: | | | |
| | 1 They are sediments carried by a river, consisting | of sand, cla | y, and | b |
| | rock materials. | (,, | · |) |
| | 2 It is a fan-shaped land that is formed when a riv | er enters a | sea c | or a |
| | lake. | (HINGHHAD MADE) |))-molum moludadadda. | ······ |
| | 3 It is a process that causes the carving of rocks into | o different sh | napes | by |
| | wind-blown sand. | (| -11779-789-70-411411 |) |
| | It is the landform that is formed by the erosion an | d deposition | of sa | ınd. |
| | | Anceliteteerterearren | II POT I I I MARIO O CHARACA |) |
| Q | 4. Complete the following sentences using the v | vords betw | een t | he |
| | brackets: | | | |
| | (deposition - canyon - triangular - decreases - increa | ses – delta – | erosio | on) |
| П | 1 A is formed by the erosion process, v | while a | reason vegagorano-gas, | is |
| | formed by the deposition process. | | | |
| | 2 The Nile River Delta has a shape. | | | |
| | 3 Sand dunes are formed by the and | pr | ocess | ses. |
| | | (Beh | eira 20 | 24) |
| | When the force of blowing wind, the | sand can't t | ravel | for |
| | a long distance. | (A | ex. 20 | 23) |

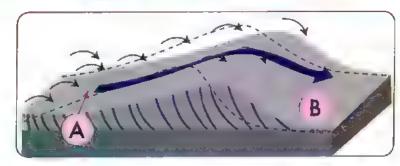
Q5. Study the following figure, then complete:

- 1. This figure represents the process that carves the shape of this rock.
- 2. This process occurs by the effects of

(Sharkia 2024)



Qó. Study the following figure, then complete:



- 1 The erosion of sand occurs in the arera of letter
- 2 The deposition of wind-blown sand occurs in the arera of letter ...

Q7. Give reasons for:

- 1 Plants of wetlands and their roots help in the formation a delta.
- 2 The silt carried by a river is deposited when the river enters the ocean.
- 3 Sand dunes are formed in deserts.

Q8. What happens if:

Wind that is carrying sand particles hits a big rock?

(Suez 2023)

Q9. Arrange the following geological processes according to their occurrence in nature:

Deposition - Weathering - Erosion

(Menofia 2024)

Glossary

| | WW. 007 | - Concept 1 (Dev | ices and E | nergy) |
|-----------------|-----------------------|-----------------------------------|----------------------------|--|
| Lesson | (1) | | | |
| Devices | الأجهزة | Energy | āli in | Convert -eb |
| Technology | تكنولوجيا | Remote-controlled حکم عن بُقْد | i cars سيارات تعمل بالت | Mors Curiosity Rover پة اكتشاف العريخ |
| Solar panels | الألواح الشمسية | Resources | المواري | ىل Transform |
| Truck , ` | شاجنة | Plane · | طائرة | Boat of Park and the wo |
| Operated remote | تعمل عن بُعْد الناه | Tasks | مهام | تعملاند Turning corner |
| Battery | يطارية | Store | يخزن | طاقة الكيميائية Chemical energy |
| Sensors | مستشعرات | Electrical energy 4 | الطاقة الكهربائية | طاتة الصرتية Sound energy |
| Run out | ينقذ | Recharge | | Replace کیبال |
| Spacecraft | مركبة فشائية | Missions | بعثات | ابس Socket/Plug |
| 4.0000 | (2) | | | |
| Consumed energ | الطاقة المستهلكة ل: إ | Input energy | انطاقة المستهلكة | طاقة الناتجة Produced energy |
| Output energy | مخرجات الطاقة | Hairdryer | مجلف شعر | وزع الصابون Soop dispenser |
| Movement | حركة | Clapping | تصميق | Rubbing your hand عيديك |
| Growth | نمو | Convert | يتحول | شب Wood |
| Burn | حرق | Release | ينتج | Coal en to en |
| Remains | بالبايا | Electrical cords | أسلاك كهربائية | لك كهربائي Electrical wire |
| Copper . | نحاس | Leaks out | يتسرپ | |
| Locon | (3) | | | |
| Friction | احتكاك | Road | طريق | نترب Approach |
| Disappear - | يفتقي | Form , | يشكل | Attention ' ' sign |
| Electric bulb | مسباح كهربائي | Washing machine | غسالة | ملل Analyze |
| Determine | احسب | Record : | سچل ا | تقل 🔧 🕜 Transfer |
| Mixer/Blender | خلاط | Warming | التدفئة | |
| Lessen | (4) | | | |
| Energy flow | مسار الطالة | Track energy path | way تتبُّع مسار الطاقة | Cell phone (Mobile) تليقون المحمول |
| Vibrations | الامتزازات | Job/Function | وظيفة | Lost But |
| Noise | ضوضاء 🔒 🚉 | 1 | | |
| | U | nit 3 – Concept 2 | (About Fue | el) |
| Lesson | (1) | | | |
| Oil ' | زيت | Coal . | . لعم | از طبيعي Natural gas |
| Fossil fuel | الوقود الحفري | Extract | يستخلص | طن الأرض Underground |
| Pointer | مۇشى ، | Operate ' | يشغل : | Means of transportation ببائل النقل |

| Lesson | (2) | | | | |
|-----------------|-----------------|-----------------|--------------------|---------------|---------------|
| Considered | يعتبر | Release | تنتج | Biofuel | الوقود الحيوي |
| Planted | مزروع | Renewable | متجدد | Corn | الذرة ب |
| Wood chips | رقائق الغشب | Ancient | قديم | Charcoal | فحم نباتي |
| Conservation | بقاه | Require | يتطلب | Deforestation | إزالة الغابات |
| Negative impact | تأثير سلبي | Remoins | بقايا | Require | يتطلب |
| Pressure | ضغط | Conserve | يحفظ | Settle on | تستقر على |
| Replace | يستبدل | Sea creatures | كائنات محرية | Cover | يقطي |
| Sediments | رواسب | Rocks | منخور | Run out | ينقذ |
| Convert | يحول | Available | متاح | | |
| (Increase) | (3) | | | | |
| Steam | پمار | Regions | المناطق | Condle | شعة |
| Appreciate | يقدر | ىقىس Unplug | اقصل الجهاز عن الـ | Appliances | الأجهزة |
| Turbines | التوربينات | Generators spin | تدور المولدات | | |
| Lasson | (4) | | | | |
| Trap | يحبس | Industry | مناعة | Agriculture | الزراعة |
| Smog | الضياب الدخاني | Pesticides | مبيدات حشرية | Irritation | تهیج ِ |
| Breathe | يتناس | Lungs | الرئتان | Damage | يدمر |
| Acid rain | الأمطار الحمضية | Global warming | الاحتياس المراري | Combine | بالحدر |
| Atmosphere | القلاف الجوي | | | | |

| | | | | 7/15 | A PARK NO |
|--------------------|------------------|------------------|-----------------|-----------------|-------------------|
| | | | | | Lesso |
| أتابيب | Pipes | طواحين المياه | Watermills | ملواحين الهواء | Windmills |
| ملحن الحيوب | Grind the grains | شفرات الطاحونة | Mill's blodes | וצצט | Machines |
| ثهب | Blow | āiKī | Cost | الدنيق | Flour |
| التوريينات الجديثا | Modern turbines | الطواحين القديمة | Old windmills | وظيفة | Function |
| الفلاف الجوي | Atmosphere | الطاقة الإشعاعية | Radiant energy | أشعة الشمس | Sunroys |
| محاصيل | Crops | المزارعون | Farmers | الصوية الزراعية | Greenhouse |
| تجمع | Collect | المرايا المنحنية | Concave mirrors | مناخ | Climate |
| | | | | الألواح الشمسية | Solar panels |
| | | | | r(2) | Lescon |
| | | المولد | Generator | معدات الري ment | Irrigation equipr |
| | | | | 1/22 | 110501 |
| عملية التكثيف | Condensation | عملية التيخر | Evaporation | السدود | Dams . |
| إعادة تعبئة | Refill | نورة المياه | Water cycle | مروحة ورقية | Pinwheel |

| | | ept 1 (Breaking I | own and M | ioving Hocks) | |
|------------------|---------------------------|-------------------|--------------------|--------------------|--------------------|
| Lesso | n_(1) | _ | | | |
| Break down | تكسير | Weather change | تغيرات مناخية | Landscapes | مظاهر السطح |
| Wind blow | تهب الرياح | Wear away rocks | تفتيت الصخور | Weathering | التجوية |
| Sand dunes | الكثبان الرملية | Footprints | أثار الأقدام | Sandcastle | للعة رملية |
| Collision | تصادم | Coastal rocks | الصخور الساحلية | Needle | الإبر |
| Canyon | الأخدود | Steep | متحدرة | | |
| Lenno | n-(2) | | | | |
| Erosion | التعرية | Deposition | الترسيب | Rushing water | ماه مندفع |
| Pepbles | | C1 - 1 - 1 | 101 | Peeling on a build | ding |
| Peddies | حصي | Statue | تمثال | بنى | تقشير طلاه على الم |
| Rust | صدأ ب اب | Decide : | يقري ۽ دد د | Evidence | remiser but |
| Enormous | صغم | Sand rushes | اندفاع الرمل | Sondpaper | ررق الصنفرة |
| Boulder | صفرة كبيرة | Dissolve | تذوب | Cave | كهاف |
| Limestone | المجر الجيري | Element | عثمير | Lichens | لأشنات |
| LE000 | n.(2) | | | | |
| Antacid tablet 3 | قرص مضاد للحموض | Disso ution | فمثل | Exposed to | يتعرض ئــ |
| Lesso | n-(4) | | | | |
| Erode | يتاكل | Beach | شاطئ | Deposition | لترسيب |
| Formland | الأراضي الزراعية | Flash floods | القيضانات المفاجئة | Hurricanes | لأعاصير |
| Landslides | الانهيارات الأرضية | Creek | ممر ماڻي | Picks up | بمعل |
| Sediment | رواسي . | Mud - | طین , طین | Remains: , | المالية المالية |
| Settling | استقرار | Western Desert | الصحراء القربية | Peninsula | ئيه جزيرة |
| | linit 4 - | Concept 2 (Cha | naina Land | scanes | |
| Labe | | Concopt E (One | inging Edite | and hook | * |
| Factors | aelad | Impression | آثر | Evidence | لدليل |
| Clues | أدلة | Worn rock | صخرة متآكلة | Slope | تحدار – ميل |
| Deep | عمق | Valley | وادٍ | | |
| 1esso | m (15)) | | | | |
| Cracks | شقوق ﴿ الْأَكُولُ اللَّهِ | Patch of mud | رقعة من الطين | | |
| 1.7000 | n-(3) | | | - | |
| Streoms | جداول میاه | Landforms | تضاريس | Carve | تعن |
| Steep slope | متحدن شبيد الاتمنار | Layers | طيقات | Sediments | واسب |
| Lowland | أرض متخفضة | Flat plain | سهل متيسط | Vertical walls | واثط رأسية |
| Lacar | | | | | |
| Silt | طمي | Still water | مياه ساكتة | Particles | زيئات |
| Waterland | أرش رطبة | Barrier | ما چ ڙ | Fertile soil | قيمة قي |
| 1-0000 | n (5) | | | | |
| 2/0/010 | | | | | |



SCIENCE

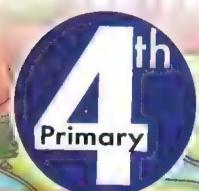
Revision Book

Prepared by:

Ahmed Omara

Revised by:

Soha Samy Mayada Hemed Karim Saif Al-deen



Second form

Contents

-1/





Concept Devices and Energy

Pages 4 - 18



Pages 19 - 32



Pages 33 - 44





Concept 1 Breaking Down and Moving Rocks

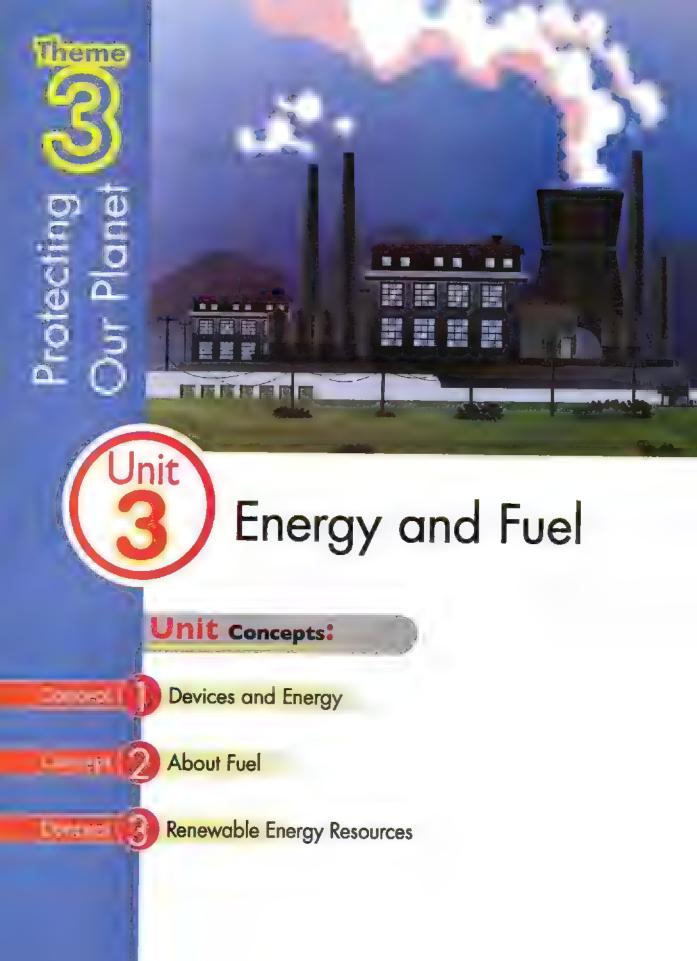
Pages 46 - 59



Pages 60 - 73

Projects 74

Government Model Exams Model Answers 98



Devices and Energy

1 Summary of Concept 1

It is the source of energy for remotelycontrolled toys.

When a battery runs out (exhausts), it must be recharged or replaced with a new one.



It stores chemical energy inside it.

Battery

It produces electrical energy

Energy change inside a toy car:

Chemical
energy
(stored in the battery)



electrical energy



kinetic energy and sound energy

Mars Curiosity Rover:

It is a robotic vechile that explores Mars.



It is operated remotely from a distance.

Mars Curiosity Rover

It uses solar panels to get the electrical energy needed to recharge its batteries.

It takes about 6 months or more to reach Mars, as Mars is about 54 kilometers away from Earth.

Energy and devices:

Not all the energy in the energy chain reaches the device.

Some produced energy doesn't help the device do its function, and it's called lost energy".

Most of the lost energy in a device leaks out in the form of heat.

The amount of energy that enters a device must be equal to the amount that comes out of it.

Low of Conservation of Energy

Energy is neither created nor destroyed; it can only be converted from one form to another.

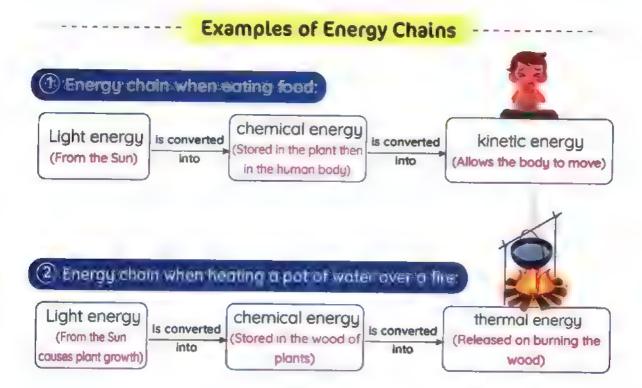
| Device | Consumed Energy (Input Energy) | Produced Energy (Output Energy) |
|--|--|--|
| • Hair dryer | Electrical energy | Thermal energy Sound energy Kinetic energy |
| Blender (mixer)Washing machineVacuum cleaner | Electrical energy | Kinetic energy Sound energy |
| Television Mobile phone | Electrical energy | Light energy Sound energy |
| Electric fan | Electrical energy | Kinetic energy |
| Electric Iron Kettle (boiler) | Electrical energy | Thermal energy |
| Soap dispenser | Potential energy (Stored in the spring) | Kinetic energy (Movement of the soap upward) |

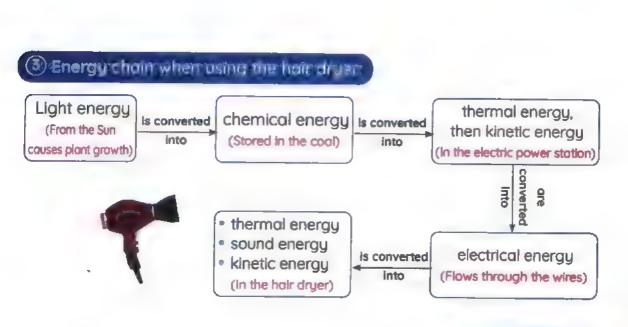
| Device | Consumed Energy (Input Energy) | Produced Energy (Output Energy) |
|-------------------------|-----------------------------------|------------------------------------|
| Hand bell Drum Guitar | Kinetic energy | Sound energy |
| Radio Door bell | Electrical energy | Sound energy |
| Remote-controlled car | Chemical energy | Kinetic energy Sound energy |
| Battery-powered clock | Chemical energy | Kinetic energy |
| • Flashlight | Chemical energy | Light energy Thermal energy |
| • Electric bulb (lamp) | Electrical energy | Light energy Thermal energy |

| | Output Energy | | |
|---|--|---|--|
| Device | Energy that helps the device do its function | Lost Energy (doesn't help the device in its function) | |
| • Hair dryer | Thermal energy | Sound energy | |
| Blender Washing machine | Kinetic energy | Sound energy Thermal energy | |
| Mobile phoneTelevision | Light energy Sound energy | Thermal energy | |
| Remote-controlled car | Kinetic energy | Thermal energy | |

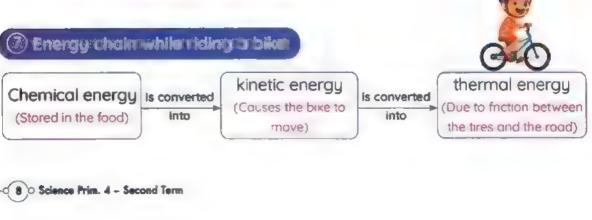
Energy chain:

- Energy chain is the path of energy from the Sun to different devices.
- Each energy chain starts with the Sun.
- The Sun is the main source of energy on Earth.









2 Definitions of Concept 1

| Chemical energy | It's a form of energy stored in the battery. It's a form of energy stored in the human body. |
|-------------------------------|--|
| Curiosity Rover | It's a robotic vehicle that can be controlled from a distance and is used to explore the surface of Mars. |
| Solar panel | It's a tool that converts solar energy into electrical energy in Mars Rover. |
| Input energy | It's the energy consumed in the device. |
| Output energy | It's the energy produced from the device. |
| Lost energy | It's the energy produced by the device that doesn't help it perform its function. |
| Energy chain | It is the path of energy from the Sun to different devices. |
| The Sun | It's the main source of energy for most forms of energies on Earth. |
| Thermal energy | It's the energy produced when the wood of trees is burned. It's the energy that is always produced due to friction. It's the energy lost while using a computer. |
| Sound energy | It's the energy produced from playing the guitar or drums. |
| Light energy | It's the energy that helps a light bulb do its main job. |
| Electrical energy | It's the energy that flows in wires until it reaches the devices. |
| Copper | It's the material from which electric wires are made. |
| Law of Conservation of Energy | Energy is neither created nor destroyed; it can only be converted from one form to another. |

Give Reasons for Concept 1

1 All toys operated remotely need energy.

• To move and do tasks, such as turning corners or moving their arms.

2 After a while of operating a toy car, it stops.

· Because the batteries are exhausted.

The batteries used in the toys cannot be used to charge the Curiosity Rover.

Because Mars Curiosity Rover is very far from any store or any plug.

Any energy chain starts with the Sun.

Because the Sun is the main source of energy.

5 Energy is conserved.

 Because energy is neither created nor destroyed; it can only be converted from one form to another.

Not all the energy that enters the device reaches it.

 Because some of the input energy escapes into other forms that the device does not use.

During running, there is a change of energy that takes place inside your body.

 Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.

When burning some wood from trees, there is a change in energy.

 When the wood from trees is burned, the chemical energy stored in the wood is converted into thermal energy.

When you touch an electric lamp, you feel heat.

Because electrical energy changes into light and heat energies.

Thermal energy is considered a wasted material in some home devices.

Because thermal energy doesn't help some devices do their main jobs.

4 What Happens if...? Concept 1

- A toy car is operated remotely?
 - The chemical energy stored in the batteries changes to electrical energy and then to kinetic energy to move the toy car.
- The batteries of a toy car are exhausted?
 - The toy car stops moving.
- An electric bulb is operated?
 - Electrical energy changes into light and thermal energies.
- An electric fan is operated?
 - · Electrical energy changes into kinetic energy.
- You rub your hands?
 - Kinetic energy changes into thermal energy.
- The bike rider pushes the paddles with his legs?
 - The chemical energy stored in his body changes into kinetic energy.
- You approach your hand to a light bulb?
 - I will feel the heat of the lamp.

5 Revision on Concept 1

| Choose the co | rrect answer: | | |
|---------------------|----------------------|--|-----------------------|
| 1 Most toys deper | nd on as | a source of ene | rgy. |
| a. water | b , batteries | c. fuel | d. food |
| 2 Batteries store | energy in | side them. | |
| a. chemical | b. electrical | c. solar | d. kinetic |
| 3 Curiosity Rover | is designed to ex | cplore | |
| a. the Sun | b. the moon | c. Mars | d. Earth |
| 4 is conside | ered the main so | urce of energy (| on the Earth's surfac |
| a. Fuel | b. The moon | c. The Sun | d. A battery |
| 5 Some energy is | lost in most dev | ices in the form | ofenergy. |
| a. electrical | b . thermal | c. sound | d, kinetic |
| 6 Electric wires ar | re made up of | wasters and the same of the sa | |
| a. plastic | b. wood | c. iron | d. copper |
| 7 The input energ | y in Curiosity Ro | ver is er | nergy. |
| a. thermal | b . solar | c. electrical | d. kinetic |
| 8 All of the follow | ing store chemic | al energy, excep | ot |
| a. a battery | | b. an apple | |
| c. a compresse | ed spring | d. coal | |
| 9 All the following | | | |
| a. hair dryer | b. watch | c. kettle | d. electric heater |
| 10 The use | es thermal energ | y to do its funct | ion. |
| a. mobile phon | e | b. washing n | nachine |
| c. TV | | d, hair dryer | |
| 11 The produced | energy d | oesn't help the l | olender do its job. |
| a. sound | b. thermal | c. chemical | d. potential |
| | | | |

| Concept | (1 |): | Devices | and | Energy | c |
|---------|----|----|----------------|-----|--------|---|
|---------|----|----|----------------|-----|--------|---|

| 1 | When you turn o | n your television | n, the electrical e | nergy travels | 5 | |
|----|---|-------------------------------|------------------------------|----------------|--------------|-----|
| | through the | until it reache | es it. | | | |
| | a .wires | b .air | c. screens | d.plastics | | |
| 13 | B During riding a | bike, some kı <mark>ne</mark> | tic energy is co | nverted into | #******* *** | |
| | energy due to th | e friction of the l | bike's tires with t | ne road. | | |
| | a.chemical | b .potential | c.thermal | d.electrical | | |
| 14 | During charging | a mobile phone | e, the ene | ergy is stored | d in | the |
| | battery as | energy. | | | | |
| | a.chemical - ele | ctrical | b.electrical - c | hemical | | |
| | c.electrical - sou | end | d.chemical - li | ght | | |
| 15 | All the following | are from the cor | nsumed or produ | uced energie | s in | the |
| | mobile phone, ex | cept the | | | | |
| | a.chemical ener | gy | b.light energy | | | |
| | c. sound energy | | d.potential en | ergy | | |
| | Put (✓) or (X): | | | | | |
| 1 | Mars Rover and t | toy cars can be | operated from a | distance. | (| |
| 2 | Mars is located a | few kilometers of | away from <mark>Earth</mark> | ŧ | (|) |
| 3 | 3 It takes several days for a spacecraft to reach Mars. | | (|) | | |
| 4 | 4 Most energy chains start with the moon. | | | (|) | |
| 5 | The energy chain | of a burning can | dle is composed | of chemical | ener | gy |
| | converted into the | ermal energy an | d light energy. | | (|) |
| 6 | Energy can't be to | ransformed from | n one form to an | other. | (|) |
| 7 | Both the electric b | oulb and the elec | tric heater produ | ce thermal e | ener | gy. |
| | | | | | (|) |
| 8 | When you rub yo | ur hands, kınetic | energy changes | s to heat ene | rgy. | |
| | | | | | (|) |
| 9 | The produced sou | und energy help: | s the blender do | its function. | | |
| | | | | | - |) |

| 0 | Final Revision | | |
|---|---|-------------|------------|
| | There is energy loss when energy is transformed from | one form | to |
| | another. | (|) |
| | (I) When pedalling a bike, the chemical energy in your bod | y changes | to |
| | kinetic energy. | (|) |
| | The produced sound energy helps the hair dryer do its for | unction. (|) |
| | The amount of energy entering any device equals the energies produced by it. | | the) |
| | The amount of electrical energy used to charge a mo | | |
| | greater than the produced light energy. | . (|) |
| | | | |
| 4 | Write the scientific term: | | |
| | It's a robot vehicle that is used to explore the surface of Mars | 5. (|) |
| | It's the form of energy that is stored in a battery. | (|) |
| | 1t's the main source of energy for most forms of energy | ies on Ea | rth. |
| | | (|) |
| | It's the energy produced when the wood of trees is burned | d. (|) |
| | It's the energy is stored in plants in the form of sugar. | (|) |
| | It's a path that shows the energy flow from its source to | the device |) . |
| | | (|) |
| | It's a device used to convert electrical energy into light energ | y. (|) |
| | (3) It's the output energy that helps the electric kettle do its | function. | |
| | | (|) |
| | It's the energy produced from the blender that helps | it do its j | ob. |
| | | (|) |
| | 11's the energy produced from playing the guitar. | (|) |
| | 1 It's the lost energy when using a computer. | (|) |
| | 12 It's the energy that is always produced due to friction. | (|) |
| | (1) It's the material that electric wires are made from. | (|) |
| | It's the lost energy when using the mobile for a long time. | (|) |

| Complete the fo | ollowing sentences: | | |
|---|--|--|--|
| 1 In any energy cha | ain, some of the energy is lost in the form of | | |
| The energies the | at are produced from the washing machine ar | | |
| energy and energy. | | | |
| can be | used in electric power stations to generate electricit | | |
| n the electric hec | in the electric heater, energy is considered an input energy | | |
| while thermal ene | ergy is considered an energy. | | |
| To operate an ele | ctric mixer, we use energy. | | |
| Cross out the o | dd word: | | |
| 1 Food – Battery – L | Lamp - Coal | | |
| Hair dryer – Blend | der – Washing machine – Light bulb (| | |
| | | | |
| Choose from Co | olumn (A) what suits it in column (B): | | |
| | | | |
| | | | |
| Column (A) | Column (B) | | |
| Column (A) Solar energy | Column (8) a.is the source of energy for Curiosity Rover. | | |
| | | | |
| Solar energy | a.is the source of energy for Curiosity Rover. | | |
| Solar energyChemical energy | a.is the source of energy for Curiosity Rover.b.is produced when the toy car is operated. | | |
| Solar energyChemical energy | a.is the source of energy for Curiosity Rover.b.is produced when the toy car is operated. | | |
| Solar energy Chemical energy Kinetic energy | a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery. | | |
| Solar energyChemical energy | a.is the source of energy for Curiosity Rover.b.is produced when the toy car is operated. | | |
| Solar energy Chemical energy Kinetic energy | a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery. | | |
| Solar energy Chemical energy Kinetic energy Column (A) | a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery. Column (B) | | |
| Solar energy Chemical energy Kinetic energy Column (A) Chemical energy | a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery. Column (B) a.is the energy produced during running. | | |
| Solar energy Chemical energy Kinetic energy Column (A) Chemical energy Sound energy | a.is the source of energy for Curiosity Rover. b.is produced when the toy car is operated. c.is stored inside a battery. Column (B) a.is the energy produced during running. b.is the input energy in a soap dispenser. | | |



| Column (A) | Column (B) |
|-----------------|---|
| 1 Solar panels | a. converts electrical energy into sound energy. |
| 2 Electric fan | b. changes electrical energy into light and thermal energies. |
| 3 Radio | c. changes electrical energy into kinetic energy. |
| 4 Electric bulb | d. change solar energy into electrical energy. |

| Column (A) | Column (B) |
|---------------------|--|
| 1 Chemical energy | a. is the lost energy when operating a mobile device for a long time. |
| 2 Light energy | b. is used to charge the mobile battery. |
| 3 Electrical energy | c. is stored inside the mobile battery. |
| 4 Thermal energy | d. is produced from the mobile phone. |



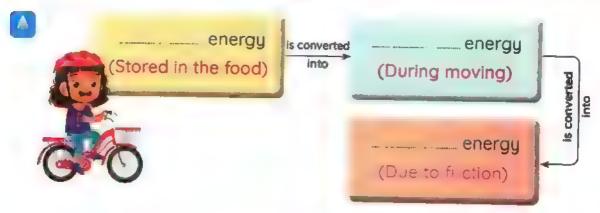
Study the following figures, then complete the questions below:

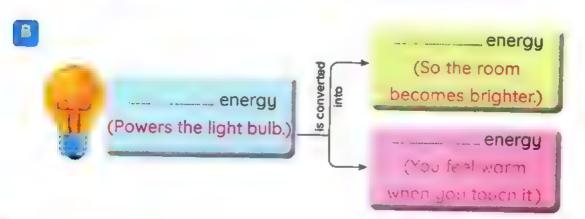


- 1 _____ energy is the output energy in all these figures.
- 2 Figure (. .) depends on solar energy to be operated.
- 3 Figures (____) and (___) can be controlled from a distance.
- ▲ The input energy of figure (_____) is the chemical energy stored in the battery.
- 5 The input energy of figure (____) is potential energy.



Complete the following diagrams:





Give reasons for:

- The batteries used to operate toys can't be used in operating the Mars Rover.
- There is a change in energy when burning the wood of trees.
- During running, there is a change of energy in your body.

| | You feel warm when you put your hands near a lighted light bu |
|---|---|
| | The sound energy produced from the blender is a lost energy. |
| | The thermal energy produced from the electric heater isn't lost energy. |
| | |
| 1 | What happens if? You rub your hands? (According to energy changes) |
| | |
| | You rub your hands? (According to energy changes) |

About Fuel

1 Summary of Concept 2

- The Sun is considered the main source of energy.
- Fuel stores chemical energy inside it.
- Fuel is a material that releases thermal energy when burned.

Uses of fuel:



Gasoline or natural gas

are used in operating all means of transportation.

Oil, natural gas, or coal are used in generating electricity.





Coal or wood are used in warming houses.

Coal, natural gas, or wood are used in cooking food.





- A car needs fuel to move.
- As the speed of the car increases, the amount of used fuel increases.
- If the fuel runs out, the car will stop.



How is a car operated



- 1 Gasoline burns inside the car's engine. (Thermal energy)
- 2 The car's engine rotates the wheels of the car. (Kinetic energy)



Types of fuel:

Biofuel

Renewable resource



Fossil Fuel

Nonrenewable resource



 It is the fuel that is made from living things that can be planted



- It is the fuel that was formed from the remains of plants and animals that lived millions of years ago.
- Fossil fuel is extracted from underground.

Examples

- 1 Wood (The most ancient fuel)
- 2 Grass
- 3 Com
- 4 Charcoal (Made from wood)
- 5 Liquid fuel (Made from corn, grass, and wood chips)
- 1 Coal (Decomposition of the remains of ancient plants)
- 2 Oil and natural aas (Decomposition of marine animals)
- 3 Gasoline (Formed from oil)

Disadvantages

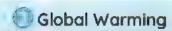
- To get it, it requires cutting down trees which may lead to deforestation.
- Burning fossil fuel produces carbon dioxide gas that may cause air pollution, acid rain and global warming.

How do we conserve fossil fuel



- 1 Walking or biking instead of driving a car.
- 2 Turning off the lights when you aren't in a room.
- 3 Replacing fossil fuel with renewable energy resources.

1 Acid Rain



Way of Formation

- Carbon dioxide gas combines with water in the air to form acid rain.
- The amount of carbon dioxide gas in the air increases forming a layer in the atmosphere.
- 2 This layer traps heat on the Earth, raising Earth's temperature.

Disadvantages

- Trees die. GR

 Due to the chemical changes in the structure of the soil.
- Due to the chemical changes in the structure of the lakes.
- 3 Decomposition of some rocks

Increasing the Earth's temperature.



Water





Similarity

• They're used to generate electricity.



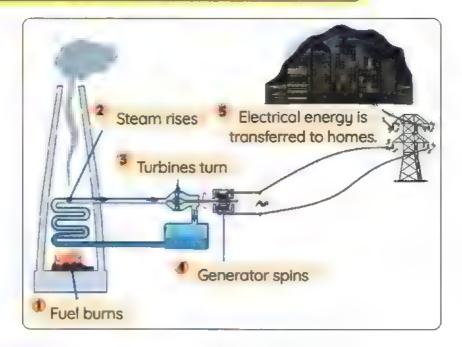
Differences

- Renewable resource of energy
- Nonrenewable resource of energy
- We must use water carefully and not waste or pollute it.
- If we waste or pollute water, it may not be replaced as quickly as we need.

Formation of oil:

- Marine organisms died millions of years ago.
- Layers of sediments and rocks cover the remains.
- 3 Over time, those remains are converted into oil due to extreme heat and pressure.

Generating Electricity Using Fossil Fuel





Fuel burns

When fuel (coal, oil, or natural gas) burns, it releases thermal energy.



Steam rises

This thermal energy is used to heat water to produce steam.



Turbines turn

The steam is directed to tubes to turn turbines.



Generator spins

 Turbines make the generator spin and convert kinetic energy into electrical energy.



Electrical energy is transferred to homes

Electrical energy travels through cables to homes and factories.

How do we conserve electricity



- Turning off the lights we don't need.
- 2 Unpluging electrical appliances after using them.
- Setting a regular electricity-free time.

2 Definitions of Concept 2

| Gasoline pointer | It's a device that helps the driver of the car check the amount of fuel. |
|------------------------|--|
| Gasoline | It's a liquid that forms from oil and is used in moving cars. |
| Fuel | It's a material that releases thermal energy when it is burned. |
| Chemical energy | It's a kind of energy stored in fuel. |
| Thermal energy | It's the energy released from burning fossil fuel. |
| Renewable resources | They are natural resources that are can be renewed after a short time of being used. They are energy resources that include solar energy and hydroelectricity. |
| Nonrenewable resources | They are energy resources that are used at a faster rate than they can be replaced. They're energy resources that include all kinds of fossil fuel. |
| Biofuel | It is a type of fuel that is made from the living organisms that can be planted. |
| Fossil Fuel | It is a type of fuel that is extracted from deep ground under the Earth's surface. It is a type of fuel that is formed by the decomposition of old, dead organisms buried under the ground. |
| Oil and Natural gas | They are types of fossil fuel produced the decay of dead marine organisms (sea creatures). |
| Coul | It is a type of fossil fuel produced from the decomposition of ancient dead plants and trees. |

- Final Revision

| Extreme heat and pressure | They're the factors needed for the formation of fossil fuel. |
|---------------------------|---|
| Charcoal | It is a kind of biofuel that is made from the wood of trees. |
| Liquid fuel | It is a kind of biofuel that is made from corn, grass and wood chips. |
| Wood | It is the oldest fuel that ancient people used. |
| Deforestation | It's a phenomenon that results from cutting trees at a faster rate to get wood. |
| Generator | It's a device that changes kinetic energy into electrical energy in electric power stations. |
| Carbon dioxide gas | It's a gas that causes global warming and acidic rains. |
| Global warming | It is a phenomenon in which the Earth's temperature increases when carbon dioxide gas increases in the air. |
| Acid rain | It is formed when carbon dioxide mixes with water in the air, and it causes the decomposition of some rocks and the death of trees. |

Give Reasons for. Concept 2

- Gasoline is very important for cars to move.
 - Because gasoline burns inside the car engine, allowing the engine to rotate the wheels.
- The gasoline pointer is very useful for drivers.
 - To help the driver check the amount of gasoline (fuel) in the car.
- Coal and wood are very important for warming houses.
 - •Because they produce thermal energy when burned.

- Biofuel is a renewable resource of energy.
 - Because it is renewed with the continuous growth of plants.
- 5 Fossil fuel is a nonrenewable resource of energy
 - *Because it starts to run out as we use it and can't be renewed easily.
- 6. Biofuel has a negative effect on the environment
 - To get biofuel, it requires cutting down trees, which may lead to deforestation.
- Fossil fuel has a negative effection the environment.
 - Because burning fossil fuels produces carbon dioxide, which increases air pollution and causes global warming.
- 8 Using coal or natural gas in electric power static is
 - To get the thermal energy needed to heat water and produce steam.
- 9 It is necessary to conserve fossil fuel.
 - To reduce air pollution.
- 10 Walking or biking is better than driving cars.
 - *To reduce the amount of burning fossil fuel and reduce air pollution.
- Water is a renewable resource of energy
 - *Because it is available and hasn't run out yet.
- 12 We must use water carefully and not waite or place in
 - Because if we waste or pollute water, we can't replace it as quickly as we need.
- 13: We should conserve electricity.
 - To avoid burning more fossil fuels and air pollution.
- 14 Generators riay an important role in the color of each inco
 - Because generators convert kinetic energy into electrical energy.
- **15** Turbines a cilian por antini e iri ele e
 - Because the kinetic energy of turbines is used to spin generators.
- 16 Engineers / watth the . n. h.
 - *To reduce the burning of fossil fuel of normal vehicles and reduce air pollution.

- Final Revision

- 77 Smog has a bad impact on the human's respiratory system.
 - Because smog consists of small harmful particles that irritate the lungs and cause damage to lung tissues.
- 18 Formation of acid rain.
 - Because carbon dioxide gas combines with water in the air to form acid rain.
- Acid rain has many negative effects on the environment.

Because acid rain may cause:

- 1- The death of trees. 2- The death of fish.
- 3- The decomposition of some rocks, including bricks of buildings.

4 What Happens if Concept 2

- The car's engine runs out of fuel
 - The car will stop.
- We cut down trees at a finite or a single of the second - It leads to deforestation.
- The remains of plant in the remains of plants.
 - Coal will be formed.
- The remaining of section is a figure of a contract of section in the secti
 - Oll or natural gas will be formed.
- 5 We waste water or pollute it
 - We may not be able to replace it as quickly as we need.
- Generators are turned on
 - Generators change kinetic energy into electrical energy.
- A person is exposed to smog
 - Smog will irritate his/her eyes and lungs.
- 🔞 Carbondo, 5 jr. 💎 👚 1 nor fore
 - Global warming happens because Earth's temperature increases slowly.

5 Revision on Concept 2

| Choose the | e correct answ | er: | |
|-------------------------------|---------------------|----------------------|--|
| All the follow | ving are found d | eeply under the E | arth's surface, except |
| a.coal | b.oil | c.natural gas | d .green plants |
| @er | nergy is stored in: | side coal. | |
| a. Thermal | b .Solar | c. Chemical | d. Electrical |
| (3) If we are going | ng on a long roa | d trip, we must che | eck the |
| a.seats | | | d.gasoline pointer |
| Fuel is used e | as a source of | energy. | |
| a. thermal | b.chemical | c. light | d .solar |
| All the follow | ing are extracted | from undergroun | d, except |
| a.coal | | c. petroleum | |
| 6is | a renewable reso | ource of energy. | |
| a. Oil | b. Coal | c .Gasoline | d.Com |
| Coal is forme | d underground o | lue to the decomp | osition of dead |
| a. plants | b .animals | c. humans | d.birds |
| (i) tak | kes millions of ye | ars to be formed. | |
| a. Coal | b.Charcoal | c. Wood | d.Com |
| One of the di | sadvantages of a | overusing biofuel is | S manufacture to the temporal temporal manufacture and the second |
| overfishing | b. wildfire | c. deforestation | d.acid rain |
| ® Both water a | nd oil | | |
| a. are renewe | able resources | b. are nonrenewo | ible resources |
| c. have the so | ame structure | d.can be used to | generate electricity |
| By heating we | ater, it turns into | A MANUSCONO 9 | |
| a. steam | b .ice | c. electricity | d fuel |

| | 12 The steam proc | duced in the el | ectric power: | station is directed in | nto tuk | oes |
|---|----------------------|---------------------|------------------------|------------------------|---------|-----|
| | to turn the | | | | | |
| | a. turbines | b. motors | c. mills | d. lamps | | |
| | 13 Electrical energ | y travels thro | ugh | to homes and fa | ctories | S. |
| | a. tubes | b. motors | c. cables | d. fans | | |
| | and | are | included in fo | ossil fuel formation | ١. | |
| | Heating - co | oling | b. Burying | - cooling | | |
| | Decaying - h | eating | d. Decayin | g - growth | | |
| | 15 Smog damage | s the tissues o | of the | system. | | |
| | digestive | b. circulator | ry c. respirato | ory d. nervous | · | |
| | 16 Cars' smog cau | ises irritation | of humans' | A M | | |
| | small intestin | es b. brains | c. hearts | d. eyes | | |
| | 17 Acld rain is form | ned when | comb | ines with water. | | |
| | a. oxygen | | b. carbon o | dioxide | | |
| | c. hydrogen | | d. nitrogen | | | |
| | 18 Using | to produce e | electrical ene | rgy is expensive. | | |
| | solar energy | b. oil | c. natural g | gas d coal | | |
| | 19 Burning fossil fo | uel causes all | the following | , except | | |
| | pollution | b. acid rain | c. global w | arming 📑 deforest | ation | |
| | Put (√) or (X): | | | | | |
| 1 | 1 As the speed of | f the car incre | ases, the am | ount of the used fu | iel | - |
| | decreases. | | | | (|) |
| | 2 We cannot drive | e a car if the g | asoline inside | the fuel tank runs of | out. (|) |
| | 3 Thermal energ | y is produced | by burning o | piece of wood. | (|) |
| | 4 Cars, buses, an | d bicycles nee | ed gasoline to | o run on roads. | (|) |
| | 5 Coal is the olde | st fuel that ha | s been used o | all over the world b | y anci: | ent |
| | people. | | | | (|) |
| | 6 Fossil fuel is mo | ade from living | g things that | can be grown. | (|) |
| | 7 The consumption | on rate of coo | l is slower the | an its formation ra | te. (|) |
| | 8 Water may not | be replaced | as quickly as | we need. | (|) |
| | | | | | | |

- Final Revision

| Concept (2): Ab | oout Fue | 0- |
|---|------------------------------|-----|
| Some plants are used to make liquid biofuel. | (|) |
| 10 The movement of a generator in an electric power station | produc | ces |
| potential energy. | (|) |
| Turbines are operated by steam in electric power stations. | (|) |
| 12 Using energy-saving light bulbs conserves electricity. | (|) |
| On cooling water, it turns into steam in electric power station | ns. (|) |
| Pesticides cause soil and water pollution. | (|) |
| 15 When the burning of fossil fuel increases, the temperature | on Ea | rth |
| decreases. | (|) |
| Mixing water with oxygen gas produces acid rain. | (|) |
| The amount of fossil fuel on Earth is unlimited. | (|) |
| Write the scientific term: | | |
| 1. It's a device that helps the car driver check the amount of fu | iel. | |
| | |) |
| 2 It's a liquid fossil fuel that burns inside the car engine. | |) |
| It's a kind of energy that is stored in fuel. (| | () |
| It's a form of energy produced by burning fuel. (| 45000-070-101(-)-0-000-0-000 |) |
| It's a material that releases thermal energy on burning. (| maarma le dishistole | .) |
| It is a natural resource that is used faster than it can be reple | aced. | |
| (| |) |
| It is a natural resource that can be replaced soon after it is u | ised. | |
| (| | |
| It is the fuel that is made from living organisms that can be presented in the following organisms. | | |
| | | - 1 |
| It is the fuel that is extracted from deep ground under the | | |
| surface. (| | |
| it's a kind of fossil fuel that is produced from the decompo | Sition | OT |
| dead marine organisms. (| |) |

11 It's a kind of fossil fuel that is produced from the decomposition of

it's a kind of biofuel that is made of the wood of trees. (

dead plants.

| 0 | Final Revision |
|---|---|
| | 18 It's a kind of biofuel that is made of corn and grass. () |
| | It's the energy produced by the generator. () |
| | 15 It's a device that operates generators. () |
| | It's a device in the electric power stations that changes the kinetic |
| | energy Into electrical energy. |
| | It is a phenomenon in which the Earth's temperature increases when |
| | carbon dioxide gas increases in the air. |
| | It is a phenomenon that causes the decomposition of some rocks and |
| | the death of trees. |
| | It's a gas that causes global warming and acid rain. () |
| | |
| | Complete the following sentences: |
| | 1 Some forms of fuel, such as and can be used |
| | in warming houses. |
| | ② Extreme and are the factors needed for the |
| | formation of fossil fuel underground. |
| | Water is considered a resource of energy, while oil is |
| | a resource of energy. |
| | Turbines in electric power stations are turned by, and they |
| | produce kinetic energy to run the of the electric power |
| | stations. |
| | The electric generator changes the energy into |
| | energy. To avoid air pollution, we must use resources of energy. |
| | |
| | Smog causes pollution. Pesticides causes and pollution. |
| | Pesticides couses and polition. |
| | Complete the following using the words between the brackets |
| | (wood - deforestation - underground - oil) |
| | Ancient people used in cooking food and warming. |
| | Gasoline is made from, while coal is extracted from |
| | Cutting trees with a fast rate causes |
| | |



Choose from column (A) what suits it in column (B):

| 10 | |
|----|-----|
| | - 4 |
| | |
| т. | 4 |
| | |

| Column (A) | Column (B) | |
|-------------------|--|--|
| Chemical energy | a. is generated in electric power stations. | |
| Kinetic energy | b. is stored inside fuel. | |
| Thermal energy | c. is produced when the car wheels rotate. | |
| Electrical energy | d. is produced when burning a piece of coal. | |
| a life at | | |

| Column (A) | Column (B) | |
|---------------|--|--|
| The Sun | a. takes a very long time to be formed. | |
| 2 Fossil fuel | b, takes a short time to be formed. | |
| 3 Biofuel | c. is the primary source of all kinds of energy. | |

| Column (A) | Column (B) |
|----------------|---|
| 11 Liquid fuel | a, was used by ancient people. |
| 2 Gasoline | b, is made from grass, corn, and wood chips |
| Charcoal | c. is a fuel that is made from oil. |
| W ood | d. is made from wood. |
| ASS IT | |

| Column (A) | Column (B) |
|----------------|------------------------------------|
| (1) Generators | a. produces thermal energy. |
| Turbines | b. produce electrical energy. |
| Burning fuel | c. is produced from heating water. |
| Steam | d. produce kinetic energy. |









- Final Revision

| 1) Wood - Oil - Com - Charcoal | (|
|---|--|
| 2 Sun – Wind – Water – Coal | Comment of the comment |
| 3 Coal – Charcoal – Natural gas – Oil | (0.000,0000 0.00 0.00 |
| Give reasons for: | |
| The fuel (gasoline) pointer is very useful | for drivers. |
| 2 Fossil fuel is considered a nonrenewable | resource of energy |
| Biofuel is considered a renewable resour | rce of energy. |
| 4 Generators play an important role in elec | ctric power stations |
| 5 The fossil fuel amount on Earth is limited | a commission commissio |
| 6 Engineers work on improving solar vehic | tles. |
| What happens if" | |
| We burn a piece of coal? | |
| 2 We cut down trees at a faster rate than t | they can grow? |
| 3 Oil is burned inside electric power station | |
| ✓ Water is heated in electric power station | s? |
| 5 Acid rain falls on buildings? | MI VIR UTGESSAMMAN GOODSHARLES IN IS IN WINDOW IT I MINUSE IN |

Renewable Energy Resources Concept (| K

Summary of Concept 3

Renewable resources of energu

They are natural resources that are replaced (renewed) at a faster rate than they are consumed.

First: Wind Energy

In the past, people needed machines to make their lives easier.

Windmill







Way of Working

- 1) The wind moves the mill's blades.
- 2 The kinetic energy is transferred to the internal parts of the mill.
- 11 The water moves the mill's blades.
- 2 The kinetic energy is transferred to the internal parts of the mill.

importance

• They are used to crush (grind) grains and make flour.



Advantages

- Low cost
- Renewable energy resources

Disadvantages



- Sometimes the wind doesn't blow. so it can't do its main job.
- · Sometimes, the water supply may dry up, so it can't do its main job.

Modern turbines are used now instead of old windmills.

Modern Wind Turbines



Old Windmill



Function

Generating electricity

· Grinding the grains to make flour

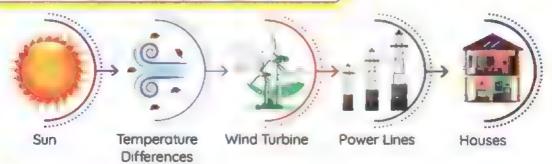
Differences

- They are taller than windmills.
- They have fewer blades than windmills.
- The blades have no openings.
- . They are shorter than wind turbines.
- They have more blades than wind turbines.
- The blades have openings.

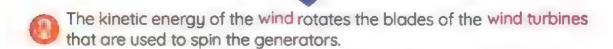
Similarity

They depend on the kinetic energy of the wind to operate.

Generating Electricity Using the Wind









Electricity is transferred through big wires towards cities to light houses and streets.

Second: Water Energy

Hydroelectricity: (Hydroelectric energy)

It is a type of electrical energy generated by water turbines in dams.



How can water be used to generate electricity



米

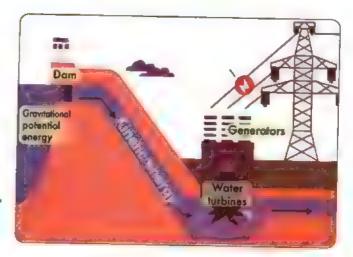
A hydroelectric dam holds back the flow of water to increase its potential energy.



When the water is released, it passes through the blades of turbines, so they rotate.



Turbines operate the generators, so kinetic energy is converted into electrical energy.



Electricity is transferred to cities through long electric wires.

| P.O.C | Wind Turbines | Water Turbines |
|--------------|--|---|
| Differences | They are placed in windy places. | They are placed in places where dams are built on rivers. |
| Similarities | Both of them are renewable resources. Both of them use kinetic energy to turn turbines. Both of them are used to generate electricity. | |

Third: Solar Energy

Sun

It is the main source of all kinds of energy on Earth.

The Sun provides us with light and heat.

The sunrays are called radiant energy (radiation).

The energy received from the Sun is called solar energy.

Uses of Solar Energy

· We can use solar energy as a source of thermal energy

Importance:

•They help farmers plant the crops that need warm climates.

How does it work?



Greenhouses

- A greenhouse allows the entry of light and radiant energy from the Sun.
- 2 Radiant energy changes to thermal energy inside it.
- 3 Thermal energy warms the greenhouse from inside.

Warming



- a Warming Ourselves
- ·When exposing yourself to the Sun, you feel warm.
- Warming Houses
- •By placing large windows on the wall that faces the sun.

© Concave mirrors



- They collect and focus the sunlight to heat a metal pot and cook the food inside.
- Solar water heater



Structure: It contains panels made of black pipes.

Location: It can be placed on the roof of a house.

How does it work?

- 1 As water passes through the pipes, it heats up.
- ² Water can then be stored in a hot water tank to be used later.

Solar Panels

Structure

They consist of a large number of small solar cells.

Idea

 Solar cells capture the radiant energy coming from the Sun and turn it directly into electricity.

Size

- · Very small to supply only one light bulb with energy
- Very large to supply buildings or cities with energy

Most solar panels are used to generate electricity to:

- 1 Light houses and streets.
- Uses 2 Operate electric devices.
 - 3 Recharge batteries of solar-cell calculators.
 - 4 Power irrigation equipment in some villages.









2 Definitions of Concept 3

| Renewable energy resources | They are energy resources that include wind energy and water energy. |
|----------------------------|--|
| Old windmill | It's a machine that used the kinetic energy of the wind to grind grains to make flour. |
| Watermill | It's a machine that used the kinetic energy of the water to grind grains to make flour. |
| Modern wind turbines | They use the kinetic energy of the wind to generate electricity. |
| Solar panels | They are composed of many solar cells. They absorb solar energy (sunlight) and convert it Into electrical energy. |
| Greenhouse | It's a structure that helps farmers to plant crops that need warm climate. |
| Concave mirror | It's a mirror used to direct and focus sunrays toward the metallic pot used to cook food inside it. |
| Generator | It's a device that turns kinetic energy into electrical energy. |
| Dam | It's a building on the river that controls the water flow and increases its potential energy. |
| Hydroelectricity | It's a type of electrical energy generated by water turbines in dams and waterfalls. |
| Evaporation | It's a process in which water changes into water vapor. |
| Condensation | It's a process in which water vapor changes into water. |
| | |

Give Reasons for Concept 3

- People use machines.
 - · To make their life easier and do tasks faster.
- Solar energy is a renewable resource of energy.
 - Because solar energy is the energy that will not run out as we use it.
- People used windmills and watermills 400 years ago.
 - To grind grains to make flour.
- People now use modern wind turbines.
 - To generate the electricity needed to light houses and operate different devices.
- Using windmills and watermills has a lot of advantages.
 - Due to their low cost and because they depend on renewable resources.
- Using windmills and watermills has great disadvantages.
 - Sometimes the wind does not blow or the water supply may dry up.
- We feel the warmth of the Sun at night.
 - Because the atmosphere, water and soil absorb heat energy from the Sun.
- Greenhouses help farmers in the agricultural field.
 - Because they help farmers in planting crops that need warm weather.
- We place large windows on the wall that faces the Sun.
 - To enable the energy of the Sun to warm the house.
- Concave mirrors are used in cooking.
 - To direct the sunrays towards the cooking pans to cook food inside them.
- The panels made of black pipes can be placed on the houses' roofs.
 - To heat water, then store it in a hot water tank.
- Solar panels are used in generating electricity for lighting houses and streets.
 - Because they convert solar energy into electrical energy.
- The Sun is the main source in generating electricity from windmills.
 - Because the Sun warms the Earth and the wind. Different parts of the world get different amounts of solar energy. This causes the blowing wind to rotate the blades of the windmills.

o Final Revision

- Dams are built on rivers.
 - To control the flow of water and increase the gravitational potential energy of water to generate electricity.
- Water returns to rivers after flowing.
 - Because water evaporates, then it condensates in the form of clouds and returns to the rivers in the form of rain.
- Renewable resources of energy are considered clean resources of energy.
 - Because they don't need burning fossil fuel to generate electricity, so they don't pollute the environment.
- There are conditions required for wind turbines to work with high efficiency.
 - · Because they should exist in windy regions.

4 What Happens if Concept 3

- ill Wind doesn't blow in an area that contains many wind turbines.
 - . The wind turbines will not move, so they can't generate electricity.
- Water falls on the blades of water turbines.
 - · The blades will rotate, so they can generate electricity.
- The force of wind increases in an area that contains many wind turbines.
 - The blades rotate faster, and the efficiency of the wind turbines increases.
- Sunlight falls on a greenhouse.
 - Radiant energy changes to thermal energy inside the greenhouse which warms the greenhouse from inside.
- Sunlight falls on a concave mirror.
 - The concave mirror focuses the sunlight on the cooking pot to cook food inside it.
- Sunlight falls on a solar-cell calculator.
 - It changes solar energy to electrical energy to charge its batteries.
- Water is released from a dam.
 - The gravitational energy of water changes into kinetic energy to rotate the water turbines and generate electricity.

5 Revision on Concept 3

| | Choose the co | rrect answer: | | |
|-----------|----------------------|------------------------|------------------------|-------------------|
| 1 | All the following | are considered ren | ewable resources | of energy, except |
| | SAME SERVICES SAME S | | | |
| | a. wind | b. coal | c. the Sun | d . water |
| 2 | The main function | on ofis grid | nding the grains a | nd making flour. |
| | a. modern turbii | nes | b. solar panels | |
| | c. dams | | d. watermills | |
| (3 | Both modern wir | nd turbines and old | d windmills are sim | ilar in their |
| | a. blades numbe | er | b. ways of worki | ng |
| | c. heights | | d. blades shape | |
| 4 | Modern turbines | are than a | old windmills. | |
| | a. longer | b. shorter | c. heavier | d. slower |
| 5 | The source of all | energies on Earth | n is | |
| | a. wind | b. the moon | c. the Sun | d. water |
| 6 | In winter, greenh | ouses help farme | rs grow plants tha | t need |
| | a. warm weathe | r | b. cold weather | |
| | c. less water | | d. less sunlight | |
| 7 | Solar panels can | be used operate | all the following, e | xcept |
| | a. a calculator | | b. a gas oven | |
| | c. irrigation equi | pments | d. street lights | |
| 8 | | y of the Sun cause | | |
| | a. chemical | | c. electrical | |
| 9 | | rom wind turbine | s is transmitted i | into houses and |
| | factories through | | | |
| | a. the wind | | c. generators | d. wires |
| 10 | - | wer is produced u | _ | |
| | a. air | b. water | | d. plants |
| 11 | | ores great | | |
| | | b. potential | | d. light |
| 12 | | e for the electric for | | |
| | a. wind | b. water | c. heat | d. electricity |
| | | | | |

| Windmills can do their job all the time, as the wind never stop | s blowin |
|--|-----------------|
| | (|
| When the kinetic energy of the wind increases, the windm spin faster. | nill blade (|
| Both modern wind turbines and old windmills are used to electricity. | generat |
| Electricity generated by wind turbines is transmitted through | the wine |
| | (|
| The power source for the electric fan is wind. | (|
| 6 Wind turbines convert kinetic energy into electrical energy. | (|
| 7 We use solar energy to preserve food. | (|
| 8 We feel the warmth of the Sun during the day only. | (|
| 9 A solar cell consists of a large number of small solar panels | i. (|
| O A calculator's output energy is solar energy. | (|
| 1 Small solar panels may be able to light buildings. | (|
| 2 The flow of water in dams can be controlled to generate electr | ricity.(|
| 3 Electricity generated from water is called hydroelectricity. | (|
| 4 Rivers store kinetic energy. | (|
| 5 The electricity produced by water is known as electromagnet | tic energ |
| | (|
| Write the scientific term: | |
| They are energy resources that include wind energy and wat | er energ |

4 It's a device that consists of black pipes used to heat water.(_____

3 It's a device that the wind rotates its blades to generate electricity.

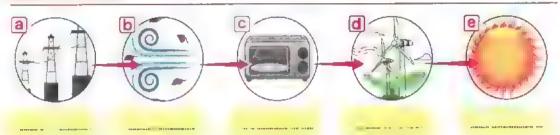
Concept (3): Renewable Energy Resources o-

| It's a structure on the rive the potential energy of | ver that controls the flow of water and increases f water. |
|--|---|
| _ | energy generated by water turbines in dams. |
| Complete the follow | |
| When the wind turbine energy. | es rotate,energy is converted into |
| | novements produceenergy, which es to generateenergy. |
| | in modern wind turbines is than in |
| | gy in cooking using concave, which onto the metal pots to heat them. |
| A STORY | ers grow crops that need warm weather. |
| | e air to and the wind to |
| | to cities through |
| | |
| Choose from colum | n (A) what suits it in column (B); |
| <u> </u> | n (A) what suits it in column (B): Column (B) |
| Choose from column (A) Greenhouses | Column (B) |
| Column (A) | |
| Column (A) Greenhouses | Column (B) a. are used in heating water. |
| Column (A) 1 Greenhouses 2 Concave mirrors | column (B) a.are used in heating water. b.are used in planting some kinds of crops. |
| Column (A) 1 Greenhouses 2 Concave mirrors 3 Panels of black pipes | column (B) a.are used in heating water. b.are used in planting some kinds of crops. |
| Column (A) 1 Greenhouses 2 Concave mirrors 3 Panels of black pipes | column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food. |
| Column (A) 1 Greenhouses 2 Concave mirrors 3 Panels of black pipes Study the following fig | column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food. |
| Column (A) 1 Greenhouses 2 Concave mirrors 3 Panels of black pipes Study the following fig | Column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food. gures, then complete the sentences below: IIII Ire (1) Figure (2) |
| Column (A) 1 Greenhouses 2 Concave mirrors 3 Panels of black pipes 1 Study the following fig Figure () is used to | Column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food. gures, then complete the sentences below: IIII Ire (1) Figure (2) |
| Column (A) 1 Greenhouses 2 Concave mirrors 3 Panels of black pipes 1 Study the following fig Figure () is used to | Column (B) a. are used in heating water. b. are used in planting some kinds of crops. c. are used in cooking food. gures, then complete the sentences below: III Ire (1) Figure (2) grind grains. j is shorter than the machine in figure (). |

→ Final Revision



To generate electricity, arrange the following figures from start to end:

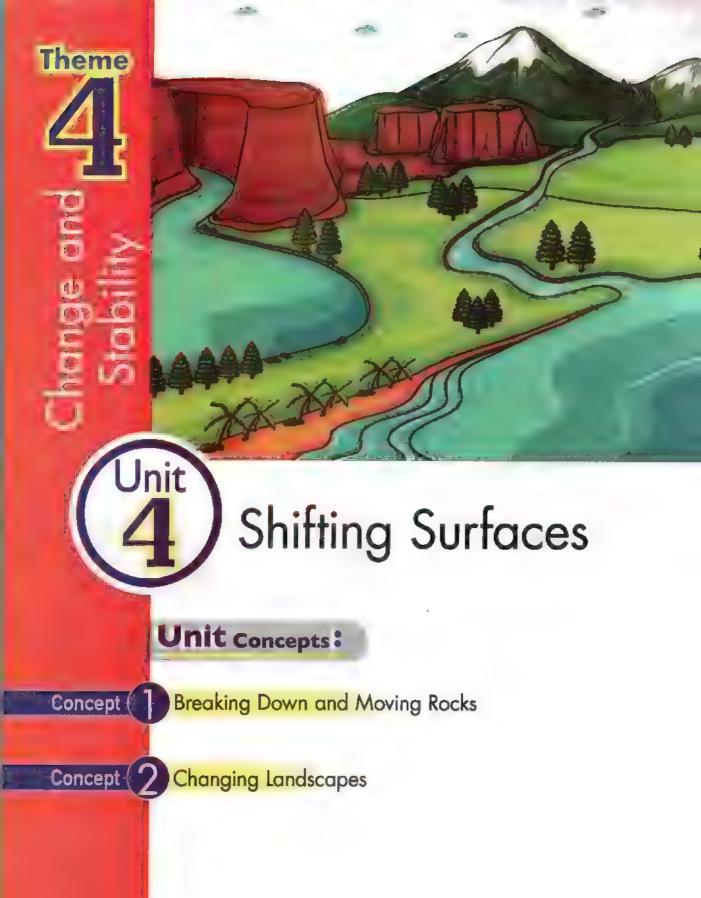


Give reasons for:

- People used windmills and watermills 400 years ago.
- 2 People now use modern wind turbines.
- 3 You feel the warmth of the Sun at night.
- Greenhouses are very important to farmers.
- 6 Generators have an important role in electric power stations.
- 6 Dams are built on rivers.

What happens if?

- Wind doesn't blow in an area that has wind turbines?
- 2 The kinetic energy that is applied on the wind turbines increases?
- 3. The water of dams becomes free?



Concept

Breaking Down and Moving Rocks

1 Summary of Concept 1

The Earth's surface always changes.

Sandcastles

- They have steep parts and sloping sides at the bottoms.
- They disappear after a short time due to the erosion of the sea waves.

(A rapid change)



Coastal rocks

- They have steep parts and sloping sides at the bottoms.
- There may be a little difference as breaking off some parts by wind or water after many years.

(A slow change)



Canyons

- They have steep needle-like parts with slopes at the sides.
- They take millions of years to be formed.

(A slow change)



has steep needle-like parts

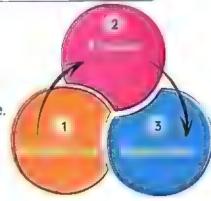
is created by water

is formed due to slow changes

has inclined sides at bottom

Shaping the Earth's surface

- Wind, water, and weather conditions are the factors that cause changes of the Earth's surface.
- Earth's surface changes through three processes which are weathering, erosion, and deposition.





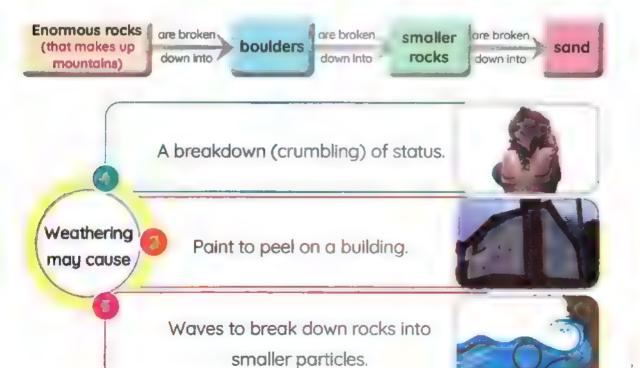




The changing of the Earth's surface begins with the weathering process



Is the process of breaking down rocks into small (tiny) particles.



Types of Weathering

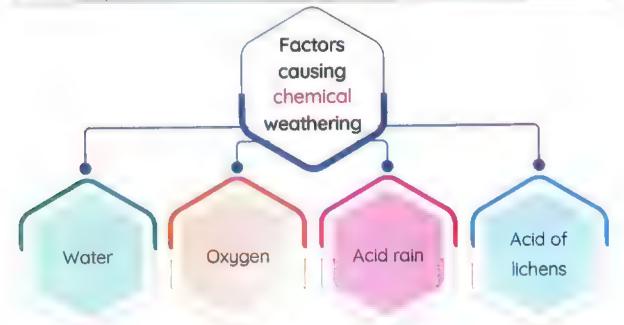
P.O.C

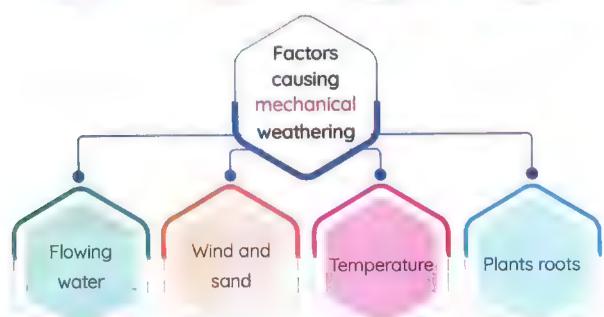
Chemical Weathering

Mechanical Weathering

Definition

 The process of breaking rocks down with a change in their structure (nature) due to chemical reactions. The process of breaking rocks down without any change in their structure (nature) due to physical factors.





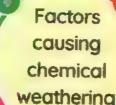


Water

 Water dissolves minerals in the rocks, and then those dissolved minerals recombine again, forming new shapes, as in limestone caves.



 Oxygen in the air reacts with the iron in some rocks, forming red-colored rust that causes rocks to be weak and easily broken.



Factors

causing mechanical

weathering

Acid of lichens



 These acids dissolve minerals in the rocks, so they become weaker and break down easilu.



Acid rain

Acid rain falls on rocks.

 These acids dissolve minerals in the rocks, so they become weaker and break down easily.



Flowing water

- Flowing water carrying some sand and gravel causes:
- a Scouring edges off boulders.
- **b** Breaking off large pieces of tumbled rocks due to collision with each other

Plants roots

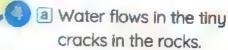
- a Plant roots grow inside the cracks of rocks.
- **b** Cracks become wider.
 - Rocks are broken down.



Wind and sand

- Wind rushes sand on the rock surface.
- Friction occurs between sand and rocks.
- This causes the smoothing of rocks and the breaking down of them.

Temperature



- b Water expands when it turns into ice, then melts.
- By repeated melting and freezing of water, cracks in rocks become wider, causing the rocks to be broken down.









Factors

causing

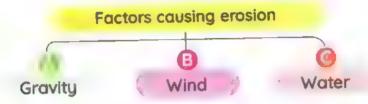
erosion

It is the process of moving sediments from one place to another.

I Had kin



Note: Sediments are weathered sand, soil, and small rocks.



Gravity

Gravity pulls rocks down mountainsides.



Wind

- The wind carries grains of sand from one place to another, where:
 - Strong wind and hurricanes blow sand for long distances.
 - Gentle wind blows sand grains for short distances.



Water

- Rivers and floods erode rocks and soil from their banks.
- Waves pull sand away from beaches.
- Rain washes the soil on hilly farmland downhills.



1 Deposition:

Deposition

It is the process of laying down eroded sediments in a new place.

Deposition by wind:

- As the wind blows, it picks up sand.
- Wind carries sand to another place.
- When the wind stops blowing, sand is deposited.

This forms:

- Small sand dunes on beaches.
- b Large sand dunes in desert.



Deposition by water:

000

- A river carries sediment eroded from its banks.
- sediments meets
 a sea, it deposits

them.

This forms:

• A delta, such as Nile Delta



2 Definitions of Concept 1

| Weathering | It is the process of breaking down rocks into smaller pieces. |
|-----------------------|--|
| Mechanical weathering | It is a type of weathering that breaks off rocks without changing its matter(structure). |
| Chemical weathering | It is a type of weathering that leads to the formation of a different material. |
| Lichens | They are tiny-like plants that live on rocks and produce acid on them, causing them to break down. |
| Oxygen gas | It is the gas that reacts with iron in rocks, forming a red- colored rust on some rocks. |
| Plant's roots | They are a part of the plant that grows in rocks' cracks, causing them to be broken. |
| Acid rain | It is a natural phenomenon that has the same effect as lichens on rocks. |
| Erosion | It is the process of moving sediment from one place to another. |
| Deposition | It is the process of settling sediments in a new place after they have been moved by erosion. |
| Gravity | It is an eroding factor that pulls the rocks down mountainsides. |
| River | It is an eroding factor that moves rocks from their banks downstream. |
| Sediments | They are pieces of weathered rocks that are moved by gravity, wind, water, or other factors. |

Give Reasons for. Concept 1

- 1 The Earth's surface is always changing.
 - Because of many factors, such as wind, water, and weather.
- 2 Wind is the main factor changing the Earth's surface.
 - Because it can break down rocks and move small rocks to another place.
- 3 Waves are from factors which can change landforms.
 - Because waves can move small parts of sand from one place to another.
- 4 Changes to the Earth's surface are different in the time of happening.
 - Because some changes of the Earth surface happen quickly, such as the disappearance of sandcastles, while others take a very long time, such as formation of canyons.
- 5 The shape of coastal rocks changes after many years.
 - Because some parts of them may be broken off by water or wind.
- 6 The main source of soil is big rocks.
 - Because when the weathering process occurs, the big rocks break down into tiny rocks, then into pebbles or grains of sand.
- 7 Oxygen gas has a bad effect on rocks.
 - Because oxygen gas can react with iron in rocks forming red-colored rust which makes the rock weaker and breaks down easily.
- 8 Plant roots may have a bad impact on rocks.
 - Because as plant roots grow inside rocks, the cracks in the rocks become wider, so the rocks break down.
- 9 Lichens have a bad impact on rocks.
 - Because they produce acids as they grow on rocks that make the rock weaker and break off easily.
- 10 There are some similarities between the effects of lichens and acid rain on rocks.
 - Both of them can dissolve the rocks or changing their nature.
- 11 Sand and wind team up to wear down large rocks.
 - Because wind rushes sand on the surface of the rocks, it smoothes and breaks them down.
- 12 It is hard to see weathering in action (in most cases).
 - · Because it takes a long period of time to happen.

Final Revision

- Chemical weathering causes a greater change to rocks than mechanical weathering.
 - Because chemical weathering forms completely new, different matter, while mechanical weathering breaks down rocks only.
- **M** Sometimes you can see erosion happening.
 - Because sometimes we can see flash floods, hurricanes, or landslides.
- **B** Gravity is one of the eroding factors.
 - Because gravity pulls rocks down mountainsides.
- **Erosion** and deposition are linked processes.
 - Because eroded rocks must be deposited over time.
- The formation of a delta.
 - · As a result of the deposition process when a river meets a sea.

4 What Happens if Concept 1

- The waves hit a sandcastle?
 - · The sandcastle will be gone (disappeared).
- Water runs over rocks?
 - · Water will dissolve some minerals in rocks.
- Oxugen in our atmosphere reacts with Iron in the rock?
 - · A red-colored rust will be formed, so rocks are broken down more easily.
- The continuous melting and freezing cycle of water inside rocks cracks?
 - Water expands, causing the cracks in the rocks to become wider, so the rocks break off.
- Acid rain falls on rocks?
 - Acid rain will dissolve the minerals in rocks, so they become weaker and break down easilu.
- Lichens grow on the rocks?
 - · They produce acids that can break off rocks.
- A plant's root grows inside rocks?
 - The cracks become wider so rocks break down easily.
- Rain falls on a hilly farmland?
 - Rain will carry the weathered rocks and soil on farmlands.
- Wind stops blowing (concerning the process happening to sand)?
 - The deposition process will happen.
- MA river carrying sediments meets a sea?
 - The deposition process happens and a delta may be formed.

5 Revision on Concept 1

| Choose the correct answer: | |
|--|---------------------------------------|
| Steep valleys formed due to flowing | ng water erosion are called |
| a. hills b. sand dunes | c. canyons d. deltas |
| 2. A canyon may take to | be formed. |
| a. minutes b. hours | c. days d. years |
| All the following are reasons | for chemical weathering, except |
| as many programming to the contract of the con | |
| a. water b. plant roots | c. acid rain a oxygen gas |
| may cause chemical or | r mechanical weathering. |
| a. Lichens b. Oxygen | c. Water d. Rocks |
| | represents mechanical weathering? |
| a. Red-colored rust on rocks | |
| c. Roots grow inside rocks. | |
| 6 Sand is formed due to the breaking | |
| a. wood b. plastic | _ |
| 2 Limestone caves are formed due | |
| a. dissolved minerals | |
| c. red-colored rust | |
| is the process by which sec | |
| a. Deposition b. Erosion | |
| an example of | recombine with new substances is |
| a. mechanical weathering | b. weathering by wind |
| c. chemical weathering | c. erosion |
| All the following are processes that | |
| The following are processes the | it change the Earth's 30 race, except |
| | c. weathering d. deposition |
| 1 Lichens produce that di | |
| a, oxygen b. rain | c. water d. acids |
| 33 | |

- Final Revision 12 The process of breaking down rocks on the Earth's surface is called b. weathering c. decomposition d. deposition g. erosion 13 The force of _____ pulls rocks from the top of the mountain to its bottom. d. gravity a, river water b, seawater c. rainwater 14 _____ erode(s) rocks and soil from their banks. d. Gravitu b. Mountains c. Rainwater a. Rivers 15 When a river carrying sediments meets a sea, a _____ is formed. a. sand bar b. sand dune c. delta d. sand pile 16 Gentle wind can carry sand arains for ____ distances. a. short b. long c. huge d. veru long Put (\checkmark) or (x): 1 The Earth's surface changes from time to time.) 2 All changes to the Earth's surface take hundreds of years. 3 Canyons take millions of years to be formed. The Earth's surface never changes. 5 The deposition process takes place before the erosion process. (6 We can see weathering in action everywhere around us. 7 Plant roots help in the formation of rocks. 8 Rocks become stronger when iron found in them rusts. 9 Wind is one of the agents that cause weathering. 10 Chemical weathering causes greater changes to rocks than mechanical weathering. 11. Sometimes you can see erosion happening. 12 The deposition process never changes the shape of the Earth's surface. 13 The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of the wind. 14 Floods are one of the factors that cause water erosion.

15 The erosion process is usually followed by the weathering process. (

| Write the scientific term: | |
|---|--|
| 1 They are deep valleys carved by the flowing w | rater. () |
| 12 It's the process of moving rocks from one place to | o another. () |
| 3 It's the process of laying sediments down. | () |
| 4 It's the kind of weathering that changes the stre | ucture and color of |
| rocks. | (|
| 5 They are tiny, like plants, that live on rocks and | produce acids on |
| them. | (-sminstephonappy) http://decediment |
| 6 It is the gas that causes the red-colored rust or | some rocks. () |
| 7 It is a type of weathering that occurs in rocks | and leads to the |
| formation of a completely different material. | (1-01-30-11 M- WI MINISTER PROPERTY OF CONTROL OF CONTR |
| 8 It is a type of weathering that breaks rocks do | own without changing |
| their matter. | (and consider his of a subdatalant described and a successment of a |
| 9 It is an eroding factor that pulls rocks down ma | ountainsides. |
| | (1-00-00-000000000000000000000000000000 |
| 10 It is an eroding factor that moves rocks from the | eir banks downstream. |
| | (************************************** |
| 11 It is the process that lays sand down when the | |
| | (************************************ |
| 12 It is a landform of deposited sediments formed | |
| a sea. | *************************************** |
| Complete the following using the words be | tween the brackets: |
| | |
| (Mechanical - Acid rain - chemical - oxygen - Ac | · |
| 1 The melting and freezing cycles of water have | |
| as they make the cracks in the ro | |
| 2 produced by lichens may dissolve | |
| has the same effect of lichens on | |
| weathering and weathering are | |
| 5 When the in air reacts with | in rocks, |

a red-colored rust is formed.

- Final Revision

- (water Nile Delta hurricane deposition gentle wind Egyptian Western Desert)
- A ____ forms a small sand dune, while a ____ forms large sand dunes like that in the ____.
- 2 ____ is a fan-shaped mass of mud and sediments.
- 3 Wind, _____, and gravity are natural factors that control erosion process.
- 4 The process of laying down sediment after its erosion is called

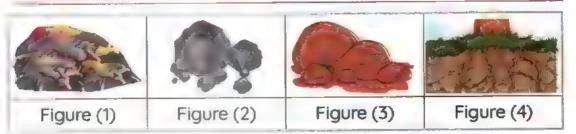
5

Choose from column (A) what suits it in column (B):

| Column (A) | Column (B) | |
|------------------------|--|--|
| 1 Lichens | a. causes mechanical weathering of rocks. | |
| 2 Water | b. causes the red-colored rust on a toy car. | |
| 3 Oxygen | c. produce acids as they grow on rocks. | |
| 4 Melting and freezing | d. may cause both types of weathering. | |
| 1 2 3 | 5740 | |



Study the following figures, then complete the following sentences:



- Figure (_____) represents a living organism that causes mechanical weathering.
- 2 Figure (_____) represents a living organism that causes chemical weathering.
- 3 Oxygen gas has a bad effect on rocks in figure (_____).

| Giv | ve reasons for: |
|-------------|--|
| ① Th | e Earth's surface is always changing. |
| ② Ox | ygen in the atmosphere has a bad effect on some rocks. |
| 3 Lic | hens dissolve rocks as they grow. |
| | emical weathering causes greater changes to the rocks. |
| E rc | osion and deposition are linked processes. |
| Wh | at happens if? |
| - | ygen gas reacts with iron rocks, forming a red-colored rust? |
| 2) Aci | d rain falls on rocks? |
| - | e lichens that grow on rocks produce acids? |
| Pla | nt roots grow inside rocks' cracks? |

Changing Landscapes

1 Summary of Concept 2

Many factors can change the Earth's surface and form new landforms, such as:



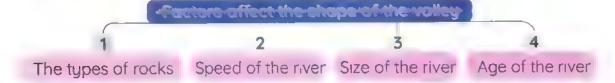


They are special types of valleys carved by flowing water.

| Processes | Weathering and erosion | |
|------------|--|--|
| Factors | Water, wind, and other factors | |
| Age | Canyons take millions of years to be formed. | |
| | • The sides are steep. | |
| Properties | Walls are narrow and vertical. | |
| | They usually consist of many layers. | |
| | | |

How are canyons formed

- 1 Gravity pulls rainwater downhill, forming small streams.
- 2 Small streams are joined together to form a bigger stream (river).
- 3 The water of the river moves fast and erodes rocks in its pathway.
- 4 When a river dries after a very long time, a canyon may be formed.



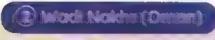
Examples of canyons and their properties

The Grand Congon

• The Grand Canyon is the largest canyon in the world.

| Location | United States of America |
|----------|-------------------------------------|
| Age | It is millions of years old. |
| | • It is very large and steep. |
| Shape | • It contains many layers of rocks. |
| | • There is a river at the bottom. |







• Color: Brown and black



Color: Reddish

(Cirladi Rum (Sardan)



Color: Reddish
 V-Shaped

(1) Colored Cargari (Sinol)



Color: Reddish
 V-Shaped

- Final Revision
- · When water is moving over the sand, it pushes some of the sand away and leaves an impression.
- Small canyon:



A stream of water may have formed it.

- What is your evidence?
- There are trees and plants on both sides.
- The sides are gently sloped

What happens if it rains a lot on it?

It will become deeper.



Valleys:

They are lowland areas between mountains.

Processes

Weathering and erosion

Factors

Water, wind, and other factors.

The sides are gently sloped.

- **Properties**
- They are usually surrounded by a wide, flat plain,



Similarities between canyons and valleys

- They are formed by rivers or streams.
- They often have rivers or streams flow in the bottom.



Process Deposition

Factor Water

Shape Triangular (fan) shape



How is delto form



Fast-moving rivers carry sediments called silt



The water of the river is full of sediment that has been collected along the journey.

Silt is made up of very fine bits of sand clay or rock materials



When the rapid flowing water "of the river" enters still water "lake", or slower water "ocean or sea". water loses energy and drops the sediment that it is carrying, forming a delta

 The wetland of plants in the delta helps in increasing deposition Because they are responsible for slowing down the water in the river.

The Nile River Delta

"The most famous delta in the world".

| Area | It covers over 20,000 km² in Egypt. |
|------------|--|
| Location | Lies between Cairo and the Northern coast of Egypt. |
| Importance | It is characterized by the presence of fertile soil that allows the cultivation of different types of crops. |

→ Final Revision



Sand Dune:

| Shape | A hill of sand | |
|-----------|---|--|
| Location | Sandy desert or sandy beach | |
| Area | They are found in groups. They may cover a large area (Hundreds of meters tail). | |
| Processes | Erosion and deposition | |
| Factors | Wind-blown sand | |
| How they | Sand dunes are formed when a barrier like a rock blocks the | |

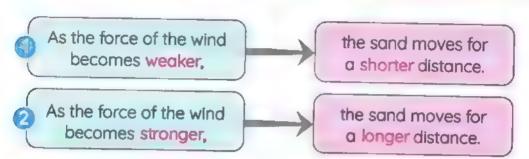
Sand Dunes Movements



- Dunes are interesting because they are constantly moving, as follows:
 - When wind blows across a dune, it erodes away the sand grains from the side it blows.
 - The grains of sand are carried up by the wind along the slope of the dune.
 - When they reach the top,
 the dune forms a barrier to the wind.
 So, the sand grains roll down the other side.

Wind Erosion

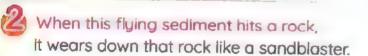
- The wind in the desert can be a powerful force of change.
- Wind and sand work together to erode rocks.
- The distance that the sand grains move depends on the force of the wind.



The way the sand moves depends on the direction of the wind.



When wind blows across the land, it picks up sand and other rock particles and carries them along.



This process carves the rock into strange shapes.

Recognizing signs of weathering, erosion, and deposition is very useful.

Because it helps us build houses in safe places, where:

- People must not build a house on a hill that is eroding.
- 2 People must not build a house very close to a river.



2 Definitions of Concept 2

| They are lowland areas between mountains. |
|--|
| They are special types of valleys with steep sides. |
| It is a landform formed by the deposition of sediments when a river meets a sea. |
| It is a hill of sand created by the erosion and deposition of the wind-blown sand. |
| They are sediments that contain very fine bits of sand, clay, or rock materials. |
| |

Give Reasons for Concept 2

- You must avoid building a house on a hill and exposing it to erosion.
 - Because the river may change its path and cause erosion and deposition of the house.
- There are similarities between valleys and canyons.
 - Because both of them were formed by flowing water.
 - Because they may have rivers or streams flowing through their bottoms.
- A delta is formed when flowing water enters still water.
 - Due to the deposition process, as water loses energy and drops Its sediments forming a delta.
- The roots of plants increase the deposition of rivers' sediments.
 - Because the roots of plants slow down the water movement, which increases the rate of the deposition process.
- Delta allows the cultivation of different types of crops.
 - Because it has fertile soil.
- Sand dunes are constantly moving.
 - Due to the force of the wind.

4 What Happens if...? Concept 2

- Streams of water flow over flat land?
 - They may form small canyons where they flow.
- It rains a lot in a small canyon?
 - This small canyon will get deeper.
- Small streams of water join together?
 - It will form a river, which causes more erosion.
- The wind blows across a sand dune?
 - Sand grains are eroded away from the side of the wind coming from.
- Wind-blown sand hits a big rock?
 - Sand is deposited, forming a sand dune.
- The force of the wind carrying sand increases?
 - Wind will move sand grains for a longer distance.
- The direction of the wind changes?
 - The way the sand moves changes.

5 Revision on Concept 2

| Choose the corr | ect answer: | | |
|---|-------------------|-------------------|------------------------|
| A canyon may tak | e of ye | ars to be formed | d. |
| a. hundreds | b. tens | c. millions | d. couple |
| Canyons can be for | ormed in many | ways, including | Abo to the Shelleman d |
| a. weathering only | J | b. erosion only | |
| c. weathering and | erosion | d. erosion and | deposition |
| (3) If the rain falls over | | | |
| a.its depth increa | | b. its depth dec | creases |
| c. it becomes flat | | d. not be affect | |
| The shape of a roo | ck gets worn ar | nd rounded by th | ne effect of the |
| process. | | | |
| a. weathering | d. deposition | c. erosion | d. photosynthesis |
| is/are | evidence of dep | | |
| a. A rounded, worn rock | | * | and on the ground |
| c. An area with canyons | | d. Red-colored | |
| A river may make | a new at i | | |
| a. mountain, deposition | | b. canyon, ero | |
| c. land, deposition | | d. land, weath | |
| pulls ro | | | streams. |
| a. Magnetism | 4 | c. Sunlight | d. Wind |
| All the following for the f | actors affect th | | ralley, except |
| a. the river's size | | b. the river's s | |
| c. the rocks' type | | d. the rocks' of | |
| | deep valley wit | h high, steep sid | |
| a. hill | b. mountain | c. canyon | d. dune |
| are lov | wland areas wit | th gently-sloped | sides. |
| a. Valleys | b. Deltas | c. Canyons | d. Dunes |
| (1) When a river mee | ets a sea or an c | ocean, a landforr | n known as a |
| is formed. | | | |
| a. canyon | b. volcano | c. mountain | d . delta |

Concept (2): Changing Landscapes -

| @ All the following are created by the water of rivers or | strea | ms, |
|--|----------|----------|
| except | | |
| b. deltas b. canyons c. valleys d. sand | dunes | |
| Silt carried by water contains all the following, except | • | |
| a. sand b. clay c. rocks d. glass | | |
| A sand dune is formed by the process, then the p | rocess | |
| a. deposition, erosion b. erosion, weathering | | |
| c. erosion, deposition d. deposition, weathering | | |
| 18 Which of the following factors helps in the formation of sand | d dune | s? |
| a. Water b. Wind c. Light d. Heat | | |
| When a rock blocks the path of flying sand, a may b | e form | ed. |
| a. dune b. river c. canyon d. delta | | |
| Put (√) or (x): | | |
| Wadi Rum in Jordan is an example of a sand dune. | | _ |
| All canyons have the same shape, texture, and color. | (| `` |
| The sides of the canyon at the beginning of its formation ar | `` | , |
| gently-sloped. | | 1 |
| Understanding the formation of landforms helps us pred | lict fut |) Iro |
| changes of landforms. | (| 1 |
| It is better to build your house on a hill that is eroding. | | Ś |
| A river never changes its path, so it's safe to build a house near any | | |
| river. | (|) |
| When a river moves down a steep slope, its speed decreases. | | |
| Most valleys are formed due to the erosion of many sedim | • | ınd |
| their transfer far away. | (|) |
| The shape of the valley depends on the type of its rocks. | (|) |
| 10 A slow-moving river has a lot of energy, so it causes more e | rosion | |
| | (|) |
| 11 A delta is formed when the speed of the river water increase | es. (|) |
| Silt carried by a river contains large bits of sand and clay. | | |
| Sand dunes are formed when a rock blocks water-blown sand. | | |
| Sand dunes are formed by the deposition process only. | | |

Final Revision The formation of sand dunes in the Eastern Desert in Egypt is due to the movement of wind. Dunes are formed at the bottom of seas. Write the scientific term: it's a deep valley that formed due to the weathering and erosion of wind and water. (2) It's a force that pulls rainwater downhill, forming small streams. It's the world's largest canyon, located in the USA. They are often found at the bottom of both canyons and valleys. 🚳 It's a sediment carried by a river that contains sand, clay, and rock materials. It's a fan-shaped land that is formed when a river meets a sea. It's a process that causes the carving of rocks into different shapes by wind-blown sand. Complete the following using the words between the brackets: 💧 (small canyon – impression – V-shaped – water stream – brown and black-colored) 🚯 When the rain falls on a flat sandy land, it will leave an Wadi Nakhr is a _____ canuon. Wadi Rum and colored canyon in Sinai are _____ canyons. In the beginning of a ______ formation, plants and trees grow at the two sides of it due to the effect of the (less - high - more - gravity - increases - sediments - many layers) Rainwater is pulled downhill, forming a small stream due to _____. When the water of a river moves downhill on a steep slope, the water speed _____ erosion. A small stream causes _____ erosion than a large river.

The force of rushing water erodes a lot of _____ of a mountain

Walls of canyons are very ____ and are composed of many _____,

and carries them away.

- (deposition canyon fan decreases increases delta)
- (1) A ____ is formed by the erosion process, while a ____ is formed by the deposition process.
- The Nile River Delta has a _____ shape.
- When the stream water speed ____, it causes ____ of sediments.
- When the force of blowing wind _____, the blown sand is carried for a longer distance.

Choose from column (A) what suits it in column (B):



| Column (A) | Column (B) | |
|--------------|---|--|
| 🕦 Wadi Nakhr | a. is a black and brown canyon in Oman. | |
| Wadi Rum | b. is a V-shaped canyon in Jordan. | |
| Small canyon | c. is a reddish canyon in Thailand. | |
| A A | | |



| Column (A) | Column (B) |
|------------|---|
| 1 Erosion | a. is the fine particles of clay, sand, and rock materials. |
| Deposition | b. occurs when a stream water rushes quickly downhill a mountain. |
| Sand dunes | c. are hills of sand usually seen in groups and they may cover large areas. |
| Silt | d. occurs when a stream water speed slows down at the end of a river. |







- Final Revision

| 1 | Cros |
|---|------|
| | |

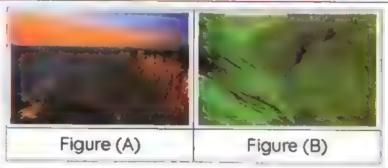
s out the odd word:

| Mountain - Valley - Gravity - Canu | |
|--|---|
| **** MODELLICITY - VOIDELL - LAFOVITH - LAFO | O |

| 1 | ` |
|---|---|
| (| |



Study the following figures, then put (\checkmark) or (x):

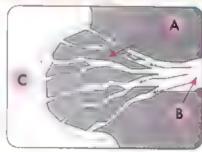


| A. | The | landform in | figure (A) | has | gently-sloped | sides. | |
|----|-----|-------------|------------|-----|---------------|--------|--|
|----|-----|-------------|------------|-----|---------------|--------|--|

- The landform in figure (B) may be surrounded by some plains between mountains.
- Both landforms are formed due to erosion carried by rivers.
- The walls of the landform in figure (A) are higher than those in figure (B).

Study the following figure, then choose the correct answer:

- 1) The area (A) would become a (delta - canyon) due to the ___ (erosion - deposition) process.
- 2 The _____ (area "C" area "B") could be a sea or a lake.
- The ____ (area "C" area "B") is a river.



Study the following figure, then complete:

- The erosion of sand occurs in area
- The deposition of wind-blown sand occurs in area ...



| 0 | Give reasons for: |
|-----|--|
| | It is not safe to build a house close to a river. |
| 2 | Valleys and canyons are formed in the same way. |
| 3 | Sand dunes are formed in a desert. |
| | What happens if? |
| : 1 | A water stream flows over a flat land? |
| 2 | A lot of rain falls on a small canyon? |
| 3 | Small streams of water are joined together? (concerning erosion) |
| | A river carrying sediments meets a sea? |
| 5 | Wind-blown sand grains hit a big rock in the desert? |

PROJECTS



Project 1 Unit 3

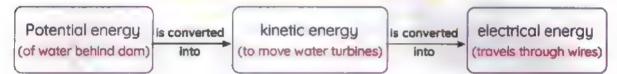
Dam Impacts

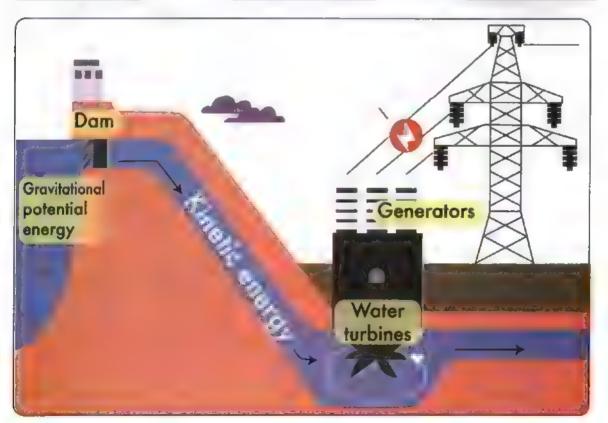


Solve Problems Like a Scientist

- >>> We have learned that humans use the kinetic energy of water to generate hydroelectricity by building dams on rivers to control water and increase the energy of water.
- >> A dam is a structure that is built on rivers for conserving water.

Energy Chain of a Dam





They are used to generate hydroelectric energy.

They control the flow of water to rotate wind turbines.

Advantages of Dams

They provide a steady water supply.



The cost of construction of dams is high.

Disadvantages of Dams The change in the path of rivers affects the migration of fish or other natural habitats.

There is a risk in the case of earthquakes.

A solution for the problem of building dams

There is a risk in the case of earthquakes.



- High-standard materials are required to build dams.
- [2] Regular maintenance of dams is necessary.

Interdisciplinary Project

Sunny Side up

- The project "Sunny Side up" helps you think about the impact of deforestation and how humans can use solar energy as a clean source of energy.
 - بساعدك مشروع الجانب المشرق على التفكير في تأثير إزالة الغابات، وكيف يمكن للإنسان استخدام الطاقة الشمسية كمصدر نظيف للطاقة.

Deforestation

- Cutting down trees to get wood for cooking may lead to deforestation that has negative impacts, such as the death of some animals or plants
- Deforestation can be stopped by using solar energy instead of wood from trees as a source of energy for cooking food.
- Some difficulties humans may face when using solar energy including the fact that the materials used to collect solar energy are very expensive.
 - قطع الأشجار من أجل الحصول على الوقود الخشبي من أجل الطهي قد يؤدي لإزالة الغابات التي قد يكون لها آثار سلبية مثل موت
 بعض الحيوانات أو النباتات.
 - يمكن وقف إزالة الغابات باستخدام الطاقة الشمسية بدلًا من خشب الأشجار كمصدر للطاقة لطهي الطعام.
 - قد يواجه الإنسان بعض الصعوبات عند استخدام الطاقة الشمسية؛ بسبب أن اللواد المستخدمة لتجميع الطاقة الشمسية باهظة الثمن.



Solar Cooker

A device that converts solar energy into thermal energy is used in cooking food.

هو جهاز يُحوَّل الطاقة الشمسية إلى طاقة حرارية تُستخدم في طهى الطعام.





Structure:

- It contains metal plates placed in a certain way to collect the largest amount of solar energy and focus it in one area.
- It also contains materials that keep the generated thermal energy inside the solar cooker for a period of time enough to cook food inside.
 - بحتوي الموقد الشمسي على ألواح معدنية مُوجَّهة بطريقة معينة: لتجميع أكبر قدر من الطاقة الشمسية
 وتركيزها في منطقة واحدة.
 - · يحتوي أيضًا على مواد تحافظ على الطاقة الحرارية المتولدة داخل الموقد الشمسي لفترة من الوقت تكفي لطهي الطعام بداخله،

Project 2 Unit 4

Forces That Shape the Earth



Solve Problems Like a Scientist

- >> In this project, you will use what you know about how the surface of the Earth changes to model how different environmental factors have affected the landscape of Wadi Nakhr over time.
- >> Wadi Nakhr's landscape has been shaped by the weathering forces of running water, wind, and erosion. You can also find evidence of volcanic activity that occurred millions of years ago.
 - سنقوم في هذا الشروع بتصميم نموذج يُوضَح أثر العوامل البيئية على مظاهر السطح في وادى نخر بمرور الزمن.
- لقد تشكَّلت مظاهر سطح وإدى نخر بفعل التجوية التي سببتها المياه والرياح وعوامل التعرية، وقد تجد أدلة على حدوث نشاط بركاني منذ ملايين السنين.





Look at the images of landforms in Wadi Nakhr.

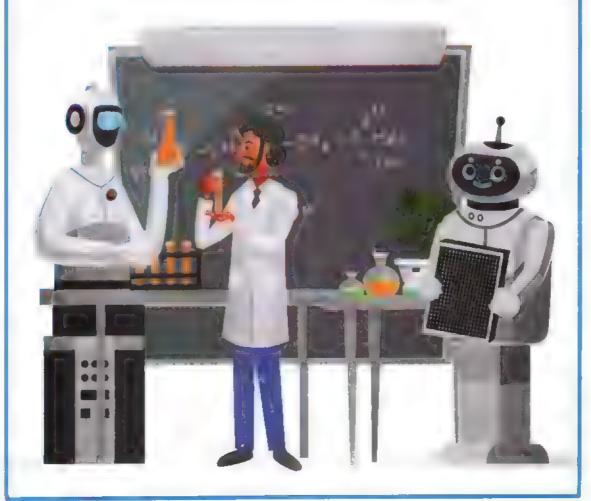
Then think about how different environmental factors can affect landscapes.

Then predict which factors affected the formation of each landform.

لاحظ الصور التالية لمظاهر سطح مختلفة في وادي نخر، فكّر في العوامل البيئية المحتلفة التي تؤثر على مطاهر السطح، توقّع العوامل المؤثرة على التضاريس الآتية:

| | | على النضاريس الاتيه: |
|-----------------------------------|---|---|
| mage | Which factors affected the formation of this landform? | (Feederson Fredrick) |
| Large chunks of basalt | Weathering by the forces of wind and water. عوامل التجوية التي سببتها الرياح والماء. | Running water and wind carrying sand carve and break down rocks. تتسبب المياه الجارية والرياح المملة بالرمال في نحت وتفتيت الصخور. |
| Smooth and steep sides | | |
| Deep canyon, layers of rocks | | |
| Folded and rippling mountainsides | | |

Government Model Exams



-082 Science Prim. 4 - Second Term

1 Cairo Governorate – Exam 1

| (A) Choose the cor | rect answer: | | | | |
|-----------------------|-------------------------|--------------------|--|--|---------|
| The forms of fue | present in car fo | uel stations are | промилана манениции 1 | | |
| a. gasoline and v | vood | b. natural gas | and coal | | |
| c. wood and coa | c. wood and coal | | | 9 | |
| Curiosity Rover is | s designed to exp | olore | | | |
| a. Earth | b. Mars | c. the Sun | d. the mo | on | |
| Sand is formed b | y the breaking o | down of | | | |
| a. glass | b. wood | c.rocks | d. plastic | | |
| All the following : | processes chang | je the Earth's sur | face, except . | · •••••••••••••••••••••••••••••••••••• | miere 4 |
| a. weathering | b, erosion | c. digestion | d. deposit | ion | |
| (B) What happens | to a flat land if a | water stream fl | ows over It? | | |
| | Questi | on (2) | | | |
| (A) Put (/) or (X): | 4555 | | | | |
| Both canyons ar | ıd valleys often h | nave rivers at the | eir bottom. | (|) |
| Plants roots help | in the formation | of rocks. | | (|) |
| Energy can't be | changed from or | ne form to anoth | er. | (|) |
| The Sun is the mo | ain source of forr | ming biofuel and | fossil fuel. | (|) |
| (B) Give a reason for | r: Iron in rocks r | may rust. | | | |
| | Questi | on (3) | | | |
| (A) Complete the f | | | words belo | ow: | |
| (th | nermal – gravity | – chemical – wa | rm) | | |
| When fossil fuel | is burned, it prod | ucesene | ergy. | | |
| When we expose | our bodies to th | ne Sun, we feel | **** ********************************* | | |
| Types of weather | ring can be class | sified into mecha | nical weather | ing o | ind |
| weathering | ng | | | | |
| Rain water is pul | led downhill form | ning small strear | n due to | MINISTRAÇÃO Ó | |
| (B) Cross out the or | dd word: Solar e | energy - Coal - N | atural gas - C | Gasol | ine |

2 Cairo Governo ala - Exam 1

| A) Choose the | correct answer | | | | |
|------------------------------|----------------------|------------------------|---|--------|------|
| - | | ive to the combina | tion of | | |
| a. dissolved | | b. red-colored | | | |
| c. living org | anisms | d. acid rains | | | |
| A canyon m | nay take of | years to be formed | d. | | |
| a, hundreds | | 411- | d. a cou | ple | |
| Inside the el | ectric power station | ns, the heating of | | | .חונ |
| a, turbines | | rs c. water | d. fuel | | |
| The energy | source in a toy car | Is the | | | |
| a. engine | b. tires | c. battery | d, fuel | | |
| B) What happ | ens if: A river carr | ying sediments me | ets a sea? | | |
| | Oues | tion (2) | | | |
| A) Put (/) or (| | | | | |
| _ | | ne increase of the o | XUGEN Derce | entage | in |
| the atmosph | | | |) (|) |
| Deposition p | process never chan | ges the shape of th | ne land. | (|) |
| and the second | conserve all forms | | | (|) |
| | | ines is transmitted th | rough the wi | ind (| 1 |
| | | ust reduce the usag | | | |
| | | tion (3) | | | |
| A) Complete ti | | tences using the | words hel | OWC | |
| | | une – weathering – | | | |
| | | ng-wind sand hits o | | | |
| | | which rocks are br | | to for | m |
| sediments. | | | | | |
| Some forms | of fuel can be use | ed in cooking food, | , such as wo | ood ar | nd |
| * 10079488888888800784444444 | | | | | |
| | | dform found betwe | en mountai | ns. | |
|) Cross out th | | | | | |
| Solar energy - V | Vind energy - Natu | ral gas - Water | (,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | _) |
| | | | | _ | |

84 Science Prim. 4 - Second Term

3 Cairo Governorale Lillun Ilina

| (A) Choose the co | rrect answer: | | | |
|-----------------------------------|----------------------|--------------------|-------------------------|------|
| The main source | e of most of energ | y on Earth is the | gamaga gaga humilini. B | |
| a. electricity | b. Sun | c. moon | d. wind | |
| is the pr | rocess in which sed | liments are move | ed to another pla | ce |
| on the Earth's s | urface. | | | |
| a. Erosion | b. Weathering | c. Deposition | d. Melting | |
| Nonrenewable | resources of energ | y include | • | |
| a. wood | b. gasoline | c. grass | d. water | |
| Which of the following | llowing factors help | os in the formatio | on of sand dunes | ? |
| a. Water | b. Wind | c. Light | d. Heat | |
| (B) What are the t | ypes of weather | ring? | | |
| | Questio | m (2) | | |
| (A) Put (/) or (X): | Questio | (2) | | |
| Using fossil fuel | protects the envir | onment from pol | llution. (|) |
| Mechanical wee | | | | :ks |
| | stance is formed. | - | (|) |
| The shape of the | ie valley depends (| on the types of re | ocks. (|) |
| The electrical er | nergy that is genero | ited from water is | called hydroelect | tric |
| energy. | | | (|) |
| (B) What are the | actors that caus | se erosion? | | |
| | Questio | m (2) | | |
| (A) Write the scie | | M (3) | | |
| It's a deep valle | | | | ` |
| It is formed from | | | | |
| periods of time | | piants and anin | (| - |
| | | r destroyed: it ca | | |
| from one form | ther be created no | r destroged, it ca | (| |
| | | al the water flo | | - |
| | on rivers to contr | of the water no | w and increase | |
| potential energ (B) Give an examp | - | that is formed by | * | _ |
| (D) GIVE All EXAMI | A Idialolli | andria ionned by | debosition broce | .33. |

4 Colro Osvernorale - Al-Azhaer Al-Star M

Question (1)

| | 4.0 | 4 | |
|--------|-----|---------|---------|
| Choose | the | correct | answer: |

c. Nile River delta formation

| 1 | is a renew | able resource of | energy. | |
|-----|---------------------|--------------------|-----------------|------------------|
| | a. Coal | b. Natural gas | c. Water | d. Fossil fuel |
| 2 | The input energy | used to control th | ne Mars explor | ation vehicle is |
| | a. electrical energ | y | b. light energ | y |
| | c. kinetic energy | | d. mechanica | al energy |
| (3) | Which of the follo | wing is an evider | nce of erosion? | |
| | a. Sand dunes for | mation | b. Forming ro | ocks crumbs |

Question (2)

d Breaking of a rock

Choose from column (A) what suits it in column (B):

| Column (A) | Column (8) |
|-------------------------|---|
| The Law of | a. is among nonrenewable energy |
| Conservation of Energy: | resources. |
| 2 The Sun | b. Energy isn't destroyed, but it can only be converted from one form to another. |
| 3 Wind turbines | c. convert wind energy into electrical energy. |
| | d. is the main source of energy on Earth. |
| | e. Energy is destroyed and cannot be transformed from one form to another. |

Question (3)

Put (√) or (X):

| | Most valleys are formed due to the erosion of many sedimen | ts c | bnı |
|---|---|------|-----|
| | their transfer far away. | (|) |
| 2 | The formation of sand dunes in Eastern Desert in Egypt is due | to | the |
| | movement of the wind. | (|) |
| 3 | The energy produced from the flowing water of waterfalls and | d d | am |
| | turbines is called chemical energy. | (|) |

Question (4)

Write the scientific term:

- 11's a type of fuel made from living organisms that can be planted.
- It's the energy produced by the biender that helps it do its job.
- It's the process in which rocks are broken into smaller particles.

Question (5)

Complete the following sentences using the words below:

(wood - water - electrical - light - coal - natural gas)

- Ancient people used ____ as a fuel before discovering gasoline.
- is a renewable resource of energy.
- The energy that is produced from solar panels is _____ energy.

Science Prim. 4 - Second Term (87)

5 Gira Govarnuruio - Exam 1

| | Question | | | | |
|-----------------------|------------------------|---------------------|----------------|-------|-----|
| (A) Choose the cor | rect answer: | | | | |
| In the washing n | nachine,energ | y is converted in | nto kinetic ei | nerg | u. |
| a. light | A . | c. electrical | | | _ |
| All the following | are forms of fossil f | uel, except | | | |
| a. wind | b. coal | c. natural gas | d. oil | | |
| Sand is formed of | due to the breaking | down of | 4 | | |
| a. glass | b. rocks | c. plastic | d. wood | | |
| The breaking do | own of large rocks | into small partic | les represe | nts t | he |
| process. | | | | | |
| a. weathering | b. photosynthesis | c. erosion | d. deposit | ion | |
| B) Give a reason for | The iron in rocks | may rust. | | | |
| Because Iron reac | ts with gas. | | | | |
| | Question | (2) | | | |
| A) Put (/) or (X): | Question | (2) | | | |
| Water causes bo | th mechanical and | chemical weath | ering. | (|) |
| A canyon is a type | | | 3 | (|) |
| (a) Oil and coal are | _ | wable energy r | esources. | (|) |
| Dams are built or | | | | (|) |
| B) What happens i | f: | | | | |
| A river carrying sedi | ments meets the se | ea? | | | |
| | Question | (3) | | | |
| A) Complete the fo | ollowing sentence | es using the w | ords belov | V: | |
| | (Sun - water - sou | nd - biofuel) | | | |
| Wind, and grav | vity are natural facto | ors that control th | e erosion pr | oces | SS. |
| Wood and charce | oal are examples of | | | | |
| Most of energy cl | hains start with the | | | | |
| The output energ | y of the hand bell is | energy | • | | |
| B) Cross out the od | ld word: | | | | |
| Plant roots - Wind - | Acid rain - Tempera | oture | (| |) |
| | | | | | |

6 Oira Governarate - Example

| | | Question (| 1) | | | |
|---------|-------------------|-----------------------|------------------|-------------|------|-----|
| (A) Put | (/) or (X): | | | | | |
| 1 Ene | ergy cannot be t | transformed from a | one form to an | other. | (|) |
| 2 A h | and bell conver | ts kinetic energy to | sound energy | l. | (|) |
| | | changes from tim | | | (|) |
| | | ocks rusts, the rocks | | nger. | (|) |
| | | Sand dunes are fo | | | | |
| | | ned due to the effe | | | | |
| | | Question | 2) | | | |
| (A) Ch | oose the corre | ect answer: | | | | |
| 1 Bo | th the hair dryer | and the electric we | ater kettle prod | iuce | ener | gy. |
| a. | chemical | b.thermal | c. light | d. potentio | ıl | |
| 2 All | the following ar | e renewable energ | y resources, ex | cept | | 4 |
| a. | natural gas | b. water | c.the Sun | d.wind | | |
| 3 | are deep v | alleys carved by th | ne flowing wate | er. | | |
| a. | Mountains | b . Hills | c. Canyons | d. Deltas | | |
| 4 M | oving the sedime | nts from a place to a | another represe | nts the | oroc | ess |
| a. | weathering | b. photosynthesis | c. erosion | d. deposit | ion | |

(B) Complete: A is a triangle-shaped mass of mud and sediments

that forms when a river enters a large body of water.

Question (3)

(A) Choose from column (A) what suits it in column (B):

| Column (A) | Column (B) | |
|---------------|---|--|
| 1° Wood | a.is a fossil fuel. | |
| 2 Coal | b. is one of the mechanical weathering factors. | |
| 3 Acid rain | c is a biofuel. | |
| 4 Temperature | d. is one of the chemical weathering factors. | |

(B) What happens if: The lichens growing on rocks produce acids?

The rocks will be

7 Gizu Governorale – Exam 3 🗡

Question (1)

Write the scientific term:

| (1) It's the form of ene | rgy that is stored in the battery of a remote | e cont | rol. | |
|--|---|----------------------------|------|--|
| Na. | | | | |
| (2) It is a phenomeno | n in which the Earth's temperature increas | es wh | en | |
| carbon dioxide gas | s increases in the air. | Military and the second of |) | |
| 3 It's energy that is | generated from windmills and transmitted | throu | igh | |
| wires to houses an | d factories. (| |) | |
| They're hills of sand | in deserts that are formed by erosion and de | epositi | on. | |
| | (| who h of our sand |) | |
| | like organisms that produce acid on rocks | , mak | ing | |
| them break down. | (wearaning) | |) | |
| | Question (2) | | | |
| ut (/) or (X): | | | | |
| 1 Energy cannot be transformed from one form to another. () | | | | |
| 2 Most energy chains start with the moon. () | | | | |
| 3 When pedalling a | bike, the chemical energy in your body ch | anges | to | |
| kinetic energy. | | (|) | |
| | nemical energy inside the food we eat. | (|) | |
| 5 Biofuel is a nonren | ewable resource of energy. | (|) | |
| | Question (3) | | | |
| A) Choose from colu | ımn (A) what suits it in column (B): | | | |
| Column (A) | Column (B) | | | |
| 1 Solar panels | a.are used in cooking food. | | | |
| 2 Curved mirrors | b. were used to grind grains. | | | |
| 3 Windmills | Care used to generate electricity. | | | |

(B) From the opposite figures:

- What is the name of this device? _____
- 2: It changes _____ energy to ____ energy.



8 Qalyubiyya Governorale

| | Qu | estion (1) | | |
|-----------------------------------|--------------------|-------------------|---------------------|----------------------------------|
| (A) Choose the | correct answe | er: | | |
| 1 is the | main source o | f energy on the E | arth's surface. | |
| a. Oil | b. Gasoline | c. Natural gas | d. The Sun | |
| 2 In water turk electrical ene | | energy of th | e water is chan | ged into |
| a. sound | b. kinetic | c. thermal | d. potential | |
| 3) is a re | enewable sourc | e of energy. | | |
| a. Oil | b. Wind | c. Coal | d. Natural gas | |
| 4 may | cause chemica | l weathering or r | nechanical weat | nering. |
| a. Oxygen | b. Water | c. Rocks | d. Lichens | |
| (B) Cross out th | e odd word: | | | |
| Weathering - Pl | notosynthesis – | Deposition - Ero | sion (| sa sassi primasismirirari sirver |
| | Ou | estion (2) | | |
| (A) Put (/) or (/ | | estion (2) | | |
| | | of years to be fo | rmed. | (|
| | - | with the moon. | | (|
| | | | ne remains of ancie | ent plant |
| | | • | | (|
| 4 Biofuel is a n | onrenewable re | esource of energ | y. | (|
| (R) Write the so | | | | |

It's a kind of weathering that changes the structure and color of rocks.

Question (3)

(A) Choose from column (A) what suits it in column (B):

| Column (A) | Column (B) | |
|----------------|---|--|
| 1 A greenhouse | a. are used to generate electricity from solar energy. | |
| 2 A valley | b. usually has a triangular shape. | |
| 3) A delta | c. has gently-sloped sides. | |
| Solar panels | d. helps to grow crops that only grow in warm climates. | |

(B) Give an example of: A fossil fuel.

9 Alexandriu Governerata - Examina

| A) Choose the correct answer: | | | | |
|---|---|----------------------|--|--|
| Energy isn't destroyed nor created from nothing. This indicates | | | | |
| a. the drawing of energy resources | _ | | | |
| b. the conservation and transforma | ation of energy | | | |
| c. that the resources of energy are | numerous | | | |
| d. the destruction of energy resource | ces | | | |
| is a resource that we consume at a | faster rate than its | formation in nature. | | |
| WindWater | c. Solar energy | d. Fossil fuel | | |
| Dissolving minerals from rocks and | recombining the | em with new | | |
| substances is an example of | | | | |
| a mechanical weathering | b. weathering by | y wind | | |
| c. deposition in rivers | d. chemical wea | thering | | |
| The steep valleys that are formed due to | - | | | |
| a. canyons b. sand dunes | C. hills | d. delta | | |
| B) Give a reason for: | | | | |
| The roots of trees can be an agent for | THE REAL PROPERTY AND ADDRESS OF THE PERTY | th's surface. | | |
| Question | | | | |
| A) Complete the following senten | | | | |
| The output energy of the hair dryer | that helps it do its | function is | | |
| energy. | | | | |
| In large cities, pollution with | causes irritatio | n in the eyes and | | |
| lungs. | adh a sia a ann al ala s | antant, and had a | | |
| Types of weathering are we | | | | |
| After rocks weathering, the proces and soil move to another place. | SS 01 | ors and the sand | | |
| B) What happens if: | | | | |
| Oxygen gas reacts with iron rocks form | ning red-colored | rust? | | |
| Question | | 1031: | | |
| A) Put (/) or (X): | (9) | | | |
| 1 Both a canyon and a valley often h | ave rivers or stea | ams that flow | | |
| through their lowest point. | | () | | |
| All the changes to Earth's surface to | ike hundreds of i | years. () | | |
| Wind and solar energy are nonrene | wable energy re | sources. () | | |
| Mars Rover robot uses the same en | iergy used in a re | emote-controlled | | |
| toy car. | | () | | |
| 3) Write the scientific term: Gasolin | ne - Coal - Natur | al gas () | | |

10 Manandriu Severnerate Exam 2

Question (1)

| (A) | Complete | the following | sentences | using th | e words | below: |
|-----|----------|---------------|-----------|----------|---------|--------|
|-----|----------|---------------|-----------|----------|---------|--------|

| (copper - Sun | - electric lamp - charcoal) |
|---------------------------------|--|
| 1 Wood and are exar | nples of biofuel. |
| 2 Most of energy chains start | with the |
| 3 The device used to convert | electrical energy into light energy is the |
| Electric wires are made of | |
| (B) Put (√) or (X): The burning | g of gasoline produces heat energy. () |
| Q | uestion (2) |
| (A) Choose the correct answ | ver: |
| 1 All the following are proce | esses that can change the Earth's surface |
| except for | |
| a. digestion b. erosio | n c. weathering d. deposition |
| 2 and cause r | nechanical weathering. |
| a. Plant's roots, acid rain | b. Lichens, water |
| c. Oxygen, water | d. Water, plant's roots |
| 3. Oil is a nonrenewable ener | gy resource that is used inside the |
| a. flashlight | b. car engine |
| c. electric fan | d. washing machine |
| 4 Curiosity Rover is used to e | explore |
| a. Earth b. Mars | c. the Sun d. the moon |
| (B) Write the scientific term | 1: |
| It's the energy produced from | playing the guitar. (|

Question (3) (A) Choose from column (A) what suits it in column (B):

| Column (A) | Column (B) |
|---------------|---|
| 1 Water | a. is formed from the remains of dead plants. |
| 2 Wind energy | b. is the main source of energy on Earth. |
| 3 Coal | c. is a liquid renewable resource of energy. |
| 4 The Sun | d. is used to generate electricity through wind turbines. |

(B) Give a reason for: The iron in rocks may rust.

11 Alexandria Governarate - Exam 1

| (A) Choose the correct answer: | | | |
|--|------------------------------|----------------|------|
| 1 When you use the hand bell, energy changes in | nto sound | ener | rau. |
| a. light b. thermal c. kinetic | | | 39. |
| 2 When a rock blocks the path of flying sand, a | may be f | orm | ed. |
| a. dune b. river c. canyon | 0 | | |
| 3 is a renewable resource of energy | | | |
| a. Coal b. Natural gas c. Water | | | |
| 4 A canyon may take of years to be formed. | | | |
| a. tens b. hundreds c. thousands | | | |
| (B) Give a reason for: | | | |
| We must turn off the lights that we don't need for a while | €. | | |
| Question (2) | | | |
| (A) Cross out the odd word: | | | |
| 1 Erosion - Weathering - Digestion - Deposition | (| *** '*** 4 355 |) |
| 2 Wood - Natural gas - Gasoline - Glass | (| 5-pro-1 |) |
| 3 Acid rain - Wind - Plant root - Temperature | (| |) |
| Fossil fuel - Waterfalls - Wind - Sunlight | (It we be acceletely assured | |) |
| (B) What happens if: | | | |
| The lichens growing on rocks produce acids? | | | |
| Question (3) | | | |
| (A) Put (/) or (X): | | | |
| 1) Both canyons and valleys often have rivers in their bo | ottom. | (|) |
| 2 Solar cells are composed of many solar panels. | | (|) |
| Mars is located a few meters away from Earth. | | (|) |
| There is a stored chemical energy inside the food we | eat. | (|) |
| (B) Write the scientific term: | | | |
| It's any substance that produces thermal energy when it is | burned. (| | _) |
| | | | |

12 Dakabila Galemorate /

Question (1)

(A) Complete the following sentences:

| form of sugar inside th | | y, which is stored in the |
|-----------------------------|--|--|
| is used as a so | | in homes and cars. |
| are deep valle | | |
| is the process | | |
| (B) What happens if: Aci | dic rain falls on rocks? | |
| | Question (2) | |
| (A) Put (√) or (X): | Question (2) | |
| (1) Using solar energy is a | a way to conserve fossil | fuel. () |
| Water is a nonrenewal | ole resource that is used t | o generate hydroelectric |
| energy. | | () |
| Acid rain is formed who | en carbon dioxid <mark>e d</mark> issol | ves in the water found in |
| the air. | | () |
| Deforestation is cause | | |
| (B) What is the role of V | vind in mechanical weat | hering? |
| | Question (3) | |
| (A) 1- Write the scientif | fic term: | |
| Energy is neither creat | ted nor destroyed; it can | only be converted from |
| one form to another. | | (be several securities exists to a specime supplimation of security) |
| | hat combines with the | iron in some rocks and |
| causes its weakness. | | (|
| 2- Complete the follo | wing table: | |
| Device | Input Energy | Output Energy |
| Electric heater | aced arrangements occorded as a second accorded as a second as | ga skil sa çilimikliksilirisis ə verdesi palaildel dedellerleri iliyelde — tərəfər valandı dedilərlərin üldərə |
| Battery in your toy | -alreadored are an exact or the consolidation of a six of advantation (State (S | \$10.18: #1111.000000000000000000000000000000000 |

(B) Give a reason for: Dams are built on rivers.

94 Science Prim. 4 - Second Term

13 Que Gevernorate

| A) Choose the corr | ect answer: | | |
|-------------------------------|-----------------------|----------------------|---------------------------|
| (1) Curiosity Rover is | designed to expl | ore | |
| a. Earth | b.Mars | c.the Sun | d.the moon |
| Which form of en | ergy is not used | or produced wh | nen you turn on an |
| electric bulb? | | | |
| a. Light energy | b .Heat energy | c. Electrical ener | gy d. Sound energy |
| The formation of | canyons takes | nd) | |
| a.a few minutes | b .a few hours | c .a few days | d.many years |
| Gentle wind can c | arry sand grains | for dista | nces |
| a.short | b .long | c.huge | d.large |
| B) Give a reason for | r: Iron in rocks me | ay rust. | |
| | Questio | n (2) | |
| A) Put (/) or (X): | Questio | (2) | |
| Wind can be consi | idered one of the | factors that caus | se weathering.() |
| The Earth's surface | e never changes | | () |
| In a modern wind | turbine, kinetic | energy is conve | erted into chemical |
| energy. | | | () |
| The Sun is the ma | | | () |
| B) Cross out the od | d word: Gasolin | e – Charcoal – C | oal – Natural gas |
| | Questio | n (3) | |
| A) Complete the fo | llowing senten | ces using the v | words below: |
| (ge | ntly - renewable | - Oil - deposition | 1) |
| The sides of the of sloped. | anyon at the beg | ginning of its for | mation are |
| is a nonrer | newable source o | f energy. | |
| Using the | resources of en | ergy costs more | money. |
| The process of lay | ing down sedime | ent after their ero | sion is called |
| 3) What hannens if | A river that carri | ies sediments m | eets the sen? |

14 Part Suid Cerail.ord 4

Question (1)

| | יייני | Choose the correct answer. | |
|----|-------|--|------------|
| | 1 | Fossil fuel needs to be formed under the Earth's surface. | |
| | | a. five years b. ten years c. hundreds of years d. millions of year | S |
| | 2 | Water flows through the turbines in the dams to generateenergy | |
| | | a. electrical b. potential c. solar d. light | |
| | 3 | When a river meets a sea or an ocean, a landform known as a | ********** |
| | | is formed. | |
| | | a. canyon b. volcano c. mountain d. delta | |
| | 4 | If the rain falls over a canyon for several times per year, | |
| | | a. its depth increases b. its depth decreases | |
| | | c. it becomes flat d. it won't be affected | |
| (E | - | Write the scientific term: | |
| | lt's | s a process in which rocks are broken down into smaller particles. (|) |
| | | Question (2) | |
| (1 | 1) | Put (/) or (X): | |
| | 1 | Most energy chains start with the moon. (|) |
| | 2 | You need gasoline to move a bicycle. (|) |
| | 3 | Deposition process never changes the shape of the land. (|) |
| | | Wind can pick up sand grains and form sand dunes. (|) |
| (| 3) | Give a reason for: Iron inside rocks may rust. | |
| | | Question (3) | |
| (1 | 4) | Correct the underlined word: | |
| | | Curiosity is a robotic vehicle that is designed to explore the surface | of |
| | | the moon. | |
| | 2 | Hydroelectric energy is a nonrenewable energy resource. | |
| | 3 | The origin of sand is the breaking down of some types of glass. | |
| | | When the water of a river travels downhill on a steep slope, its spe | eed |
| | | decreases. | |

A river erodes the sediments of a mountain over a long period of time?

(B)What happens if:

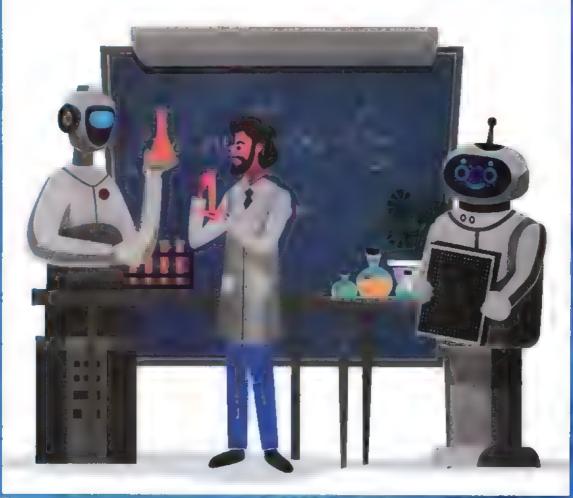
Science Prim. 4 - Second Term (97)

15 Behira Governorale

Question (1)

| A) Choose the o | correct ansv | ver: | | | |
|---|---|-------------------------|---------------|----------|------|
| The stored er | nergy inside th | ne battery of a mobile | phone is | _ ener | gy. |
| a. electrical | | b. light | c. chen | | |
| Possil fuel is of | considered a | resource of en | ergy. | | |
| a. renewable | | b. nonrenewable | c. perm | anent | |
| is the bre | aking down of | rocks into small partic | les by physic | al facto | ors. |
| a. Mechanica | l weathering | b. Chemical weather | ing c. Erosi | on | |
| The process in | n which small | particles of sand, soll | and rocks a | re mov | ed |
| from a place | to another is. | • | | | |
| a . weathering | | b. erosion | c. depo | sition | |
| B) Write the sci | ientific term | n: | | | |
| Energy is neither | created nor a | destroyed. | (| |) |
| | Q | uestion (2) | | | |
| A) Put (/) or (X |): | | | | |
| A spacecraft | takes about 6 | seconds to go to Mai | rs, | (|) |
| Most of the er | nergy we use | is produced from the | Sun. | (|) |
| Some types o | f plants can b | be used to make a liqu | uid fuel. | (|) |
| The roots of to | rees can mak | e rocks break down. | | (|) |
| B) What are the | effects of the | he smog from cars o | on humans' | healt | h? |
| | Qi | uestion (3) | | | |
| A) Choose from | column (A) | what suits it in co | lumn (B): | | |
| Column (A) | | Column (B) | | | |
| Sand dunes | a. are specia | l types of valleys that | have steep | sides. | |
| Canyons | b. are pieces | of rock that break do | wn due to | | |
| weathering and move from their place by the effects | | | | | |
| | of gravity and other factors of transportation. | | | | |
| _ | Valleys | | | _ | |
| Sediments | d. lowland ar | rea between mountair | ns. | | |
| Write the scientific term: It's the device in electric power stations | | | | | |
| that converts ki | that converts kinetic energy into electrical energy. () | | | | |





Unit 3

Comment 1

Lesson (1)

- D b
- (d

- 🐠 d
- (1) c
- 2 1
- (3) X (2) X
- X

- Curiosity Rover
 - Chemical energy
 - Solar panels
 - Solar energy or light energy
- 🙆 🌒 chemical electrical
 - replace
- sensors
- sound kinetic
- (A) (D) c
 - (B) 🛑 a
 - a d (2) b
- (2)
- **(1)**
- (2), (3)
- To be operated and controlled.
 - To be operated so it can move and explore Mars.
 - Because robots on Mars are too far from local stores or sockets (plugs) on Earth to be replaced or recharged.
- The drone cannot be operated.
 - The Mars rover cannot be operated and can't explore Mars.

Lesson @

- d

- The Sun
 - Thermal energy
 - Chemical energy
 - Chemical energy
 - The spring
- **Energy** chain
- 👍 🌑 thermal energy (heat)
 - sound kinetic Coal
 - chemical kinetic
 - - @ C
- 3 a
- (b 6

- 10 2 5
- Kinetic **(1)-(3)**
- (1) (3)
- **(2)**

- 8 Light
- chemical
- chemical kinetic
- Because all energy chains start with the Sun.
 - Because some of the energy escapes in other forms that the device doesn't use.
 - Because the chemical energy inside the wood changes into thermal energy.
 - Because the chemical energy inside your body changes into kinetic energy.

Lesson (3)

- b
- M d
- al d

- (A) a



- Electric lamp
 - Thermal energy
 - Kinetic energy Sound energy
 - Thermal energy
 - Thermal energy
 - Chemical energy
 - Blectric energy Blight energy
 - 10 The Sun
- Copper
- Law of conservation of energy
- Light energy
- electric
 - a electric- output (3) electric
 - sound kinetic
- 6 🕦 light sound
 - chemical kinetic
 - input output

- (3) (5) Chemical energy Light and thermal energies.
 - Minetic energy Sound energy
 - Electric energy Light and thermal energies
- (A) Chemical kinetic -thermal
 - (B) Electric light thermal
- Because some of the electric energy changes into thermal energy.

- Because some of the electric energy is wasted in the form of thermal energy.
- Because some kinetic energy changes into thermal energy due to friction.
- The kinetic energy changes into thermal energy.
 - The electric energy changes into light and thermal energies.
 - The electric energy changes into kinetic energy.
 - The potential energy changes into kinetic energy.
 - They will get warm (as their temperature increases).
 - You will feel warm.
 - The chemical energy changes into kinetic energy.
 - The electric energy changes into light and sound energies.

(Illesson 4)

- h the the control of - 🎒 d 🎉 a
- - Sound energy
 - Thermal energy
 - 6 Because it doesn't help the blender do its function.

2 d

Because it helps the electric heater do its function.

3 b

a a

6 It will produce thermal energy.

Model Example

Question 1

- (A) (B) a

- (B) Thermal energy

Question (2)

- (A) (B) / (B) X

(B) Lamp

Question (3)

- (A) (B) c
- (2) d

- (B) Because it doesn't help the device do its function.

Model Exam

Question 1

- (A) (II) a

- (B) Thermal energy

Question (2)

- (A) (B) X

(B) Light bulb

Question (3)

(A)

| Device | Input Energy | Output Energy |
|------------------------|-----------------|----------------------------|
| Blender Electric energ | | Kinetic and sound energies |
| Kettle | Electric energy | Thermal energy |
| Hand bell | Kinetic energy | Sound energy |

(B) The electric energy will be converted into kinetic energu.

Concept (2) Lesson (1)

- d d
- 2 b
- a d

- (6) d

- (0) d
- - 2 X
- 3 X

- The Sun
 - Gasoline pointer
 - Gasoline
 - Chemical energy
 - Thermal energy
- 👍 🐠 Fossil fuel underground
 - acoline pointer
 - coal wood
- Oil

(3) C

(A) (I) c

(C) (b)

- (B) (B) b

(2) d

- (a) b (3) d
- gasoline pointer fuel
 - **2** (1) (3) (2)
- Because gasoline burns inside the car's engine, the engine then rotates the wheels of the car.
 - Because it helps the driver check the fuel in the car's fuel tank
- The chemical energy changes into thermal energy.
 - The car will stop.
 - The chemical energy stored in the gosoline is converted into thermal energy.

Lusson 2

| 4 | SHI | C |
|---|-----|---|
| V | 12 | _ |
| | 400 | |



























1









Fuel Nonrenewable resource

Renewable resource

Biofuel.

Fossil fuel

(2) Oil (9) Coal

Charcoal

10 Liquid fuel

Deforestation

(A) (N) wood

a oil-underground

deforestation

(B) neat - pressure

Oil - coal

renewable - nonrenewable

decreased











| Renewable Resource of Energy | Nonrenewable Resource of Energy |
|------------------------------|---------------------------------|
| Charcoal | Oil |
| Corn | Gasoline |
| Grass | Natural gas |
| Wood | Coal |
| Water | |
| Wind | |

| 1 | (4) | (2) | (3) | (1) |
|---|--------------|------------|------|------------|
| 8 | a (2) | (4) | (3) | (1) |
| | (5) | | | |
| 9 | (I) Oil | | Coal | |
| | Char | rcoal | Coal | |
| | | | | |

| 1 | 0 | (A) |
|---|---|-----|
| | | |

| P.O.C | Fossil Fuel | Biofuel |
|------------------------------|-----------------------------|-------------------------------|
| Renewable or Nonrenewable | Nonrenewable | Renewable |
| Examples | Oil – Coal – Natural gas | Wood - Grass - Charcoal |

(B)

| P.O.C | Coal | Charcoal |
|------------------------------|--------------|-----------|
| Type of Fuel | Fossil fuel | Biofuel |
| Primary Source | Sun | Sun |
| Renewable or Nonrenewable | Nonrenewable | Renewable |

- Because they cannot be easily renewed.
 - Because it is renewed by the continuous growth of plants.
 - Because it will cause deforestation.
 - Because it is extracted from deep ground under the Earth's surface and can't be renewed easilu.
 - They will be decomposed and turned into oil or natural gas.
 - It will cause deforestation.
 - They will be decomposed and turned into coal.

1

Lesson 🕲

- Renewable resources

Turbine

- Renewable resourcesThermal energy
 - Electrical energySteam
 - Generator
- steam generators
 - Minetic electric
 - coal natural gas
- 5 1 b 2 d 2 a c

 Moonlight 2 Water
- (4) (1) (2) (5) (4)
- To reduce the burning of fossil fuel and air pollution.
 - Because it converts the kinetic energy into electrical energy.
- It will produce thermal energy that heats water to turn it into steam.
 - It operates turbines to produce kinetic energy.
 - It turns into steam.
 - It will generate electricity.

Lessons 4 & 5

| 1 (1) d | 2 c | ☼ c | ● b |
|------------|------------|--------|------------|
| ● d | ∰ b | d | d |
| ● d | 6 b | (II) d | €2 € |
| 0 d | @ a | (d | 🐠 d |
| 201 | (X | (3) × | @1 |
| ® 1 | ® x | ② x | BX |
| ® / | do / | 1 1 | 12 × |
| - | | | |

- Global warming Acid rain
 - Carbon dioxide
 - Renewable resources
 - Nonrenewable resources
 - Smog
- renewable
 temperature climate
- - (1)

| P.O.V | Acid Rain | Global Warming |
|---------------------------|---|---|
| Reason of Formation | Carbon dioxide is produced from burning fossil fuel. | Carbon dioxide is produced from burning fossil fuel. |
| Disadvantages | Death of trees Erosion of buildings | Increase the Earth's temperature and change the climate |

- To reduce the burning of fossil fuel and pollution.

 8
 - Because fossil fuel can't be renewed easily.

- Because solar energy doesn't pollute the environment.
- Because they cause water and soil pollution.
- (2) It will cause global warming
 - Fossil fuel will run out.
 - (3) It will dissolve the buildings' rocks.
 - It will cause air, water, and soil pollution.

(Model Exam / 1

Question 1

- (A) (h) d
- a a
- d
- (A) c

(B) Generator

Question 2

- (A) (B) X
- (2) K
- (3) X
- X @
- *****/

(B) Charcoal

Question (

- (A) (b)
- (2) c
- (3) d
- (a
- (B) Because it takes millions of years to be formed and can't be renewed easily.

Model Exam / 2

Question 1

- (A) (D d
- ② c
- (c
- (B) Nonrenewable energy resources

Question 2

- (A) (x
- ×
- (/.
- 1

(B) Coal

Question (3)

- (A) 🕝 2
- 4
- 3
- **()** 1

- **6** 5
- (B) These remains will be transformed into coal.

Concept ©

- 1 1 b 2 c
 - ② c ⑥ a
- Ø d
- ♠ b

- n c
- 10 d
- 🏨 b
- ₩ c

- 13 c
- 2 1 x
- 21
- ® X ⊗ X
- (A) X

- 9 x 10 x
- Renewable energy resources
 - Sun (2) Concave mirrors
 - Wind turbines
 - Solar water heater
- 🐠 🥼 kinetic electric
 - 2 kinetic electric
 - 3 water-wind
- Coal oil
- shorter
- mirrors- sunrays
 Greenhouses
- 🌖 🐠 Wind, water
- Oll, coal

6

| P.O.C | Old Windmills | Wind Turbines |
|------------------|------------------|------------------------|
| Function | Grinding grain | Generating electricity |
| Number of Blades | More blades | Fewer blades |
| Height | Shorter | Taller |

7 (A) (b) 2

(B) (b)

- ② c
 - 2) c
- 8 (1)
- (1) (2)

(B) a

(3) a

- way of working
- kinetic energy of wind

- a. A concave mirror
 - b. It collects and focuses sunrays on metallic pots to cook food.
 - 🔰 a. solar energy
 - b. thermal energy
 - c. the roof of houses
- 🔟 🐠 It will produce kinetic energy to grind grain and make flour.
 - It will not generate electricitu.
- Because it is natural resource that never runs out.
 - To grind grains to make flour.
 - To generate electricity.
 - To make their lives easier.
 - Because atmosphere, water, and the Earth's surface absorb the radiant energy of the Sun causing a rise in the Earth's temperature.
 - Because they help farmers plant the crops that only grow in a warm climate.

Lesson 2

- - (3) C

6 C

- of d
- (3) 1
- Wind turbine
- The Sun
- Generator
- 🚺 🌒 warms
- move blow
- (1) kinetic electric W wires
- electric irrigation equipment

- \delta 🐌 It changes kinetic energy into electric energy.
 - 🖏 lt generates more electricity, as its efficiency increases.
- Due to the difference in temperature between cold and hot air.
 - Because it converts the kinetic energy into electric energy.

Lessons 🕄 & 4

- Generator
- Dam
- Hydroelectric energy
- kinetic
 - Wind turbines water turbines
 - 3 wires
 - evaporates condenses

P.O.C. Wind Turbines Water Turbines

| Location | Windy areas | On rivers and waterfalls |
|--------------|------------------------------|--------------------------|
| Similarities | Both use renewable | |
| | energy resources. | |
| | Both change the kinetic | |
| | energy into electric energy. | |

- a. A b. potential kinetic
 - a. a dam b. potential
 - c. generator hydroelectricity
- The potential energy of the water will increase.
 - Its potential energy will change into kinetic energy.
- To control the flow of water and increase its potential energy.

.

(Model Exam Question 1 (A) (h b (B) Dam Question 2 (A) (A) X (B) Because atmosphere, water, and the Earth's surface absorb the radiant energy of the Sun causing a rise in the Earth's temperature. Question (3) 1) solar water energy 12 thermal energy 3 the roof of houses Model Exam Question 1 (A) (1) C (B) Solar heater Question @ (A) (B) X (2) J (B) Electricity won't be generated. Question (D b (2) C (A) a School Book Assess Your Learning on Unit 3 a b 2 b 1 b **2 a** (2) (d) (3) **b** (4) **(1)** (5) Electric energy - light energy thermal energy Turbines - Generator Inputs: Kinetic **Outputs: Electrical**

Unit 4 Concept () Lesson ()

- ⑤ c ⑥ c ⑦ d
- 3 / 8 / 2 x 8 /

a d

- 4 ① changing
 ② weaker
 ② very long
- 5 (t) steep
 - quickly very slowly
 - Wind water
 - Coastal rocks- sandcastle
- **6 1** b
- (1) (1) (1), (3) (2) (2) (2)
- Due to the effects of wind, water, and weather conditions.
 - Because some changes are fast and some are very slow.
 - Because it is washed away by sea waves.
 - Because water and wind may break off some parts of its rocks.
- The sandcastle will disappear after a while.
 - The sandcastle will be disappeared and the coastal rocks will be the same.

St.

Lesson 2 🖷

- 1 a b (2) b (a) b
 - 3 C C C
- C C

- 10 b
- (B) d
- d a a

- (13) b
- 14 c
- M d

- (3) X
- CO X
- 🚯 🕕 weathering
- red
- Roots
- Oxygen
- Chemical weathering

10 /

- wider
- rocks
- plants roots
- Acids
- Acid rain
- Mechanical chemical
- oxygen iron
- 6 Erosion
- Weathering
- Deposition
- Mechanical weathering
- Chemical weathering
- Lichens
- Oxygen
- (a) Root
- Limestone cave
- 10 Iron
- (2) d
- (3) b
- a

- 6 1 c
 - **(3) (2)**
- **(4)**
- (T)
- (M) (C) (C) (C)
- (M) (M)
- (C)

- **(4)**
- (C)
- **2** (1) **3** (3)
- Because it helps you decide what to wear when you go outside.

- Because it may cause the breaking down of statues and the peeling of buildings' paint.
- Due to the weathering process.
- Because the oxugen reacts with iron in a toy car, forming rust.
- Because the oxygen reacts with iron in rocks, forming rust and breaking off rocks.
- Because they produce acids that dissolve minerals found in rocks.
- Because it causes the smoothing of rocks and breaks them down
- Because it breaks down the rocks. without changing their structure.
- It will rust.
 - It will smooth the rocks and break them.
 - The rocks will be weak and easy to break.
 - It will dissolve minerals in rocks. causing them to break off.
 - It will cause chemical weathering by dissolving minerals that recombine. forming new substances.
 - Acid will eat away rocks so they become weaker and break down easily.
 - The cracks become wider, so the rock breaks down.

Lesson 3

(2) b

(8) d

- **3** b
 - (2) C
- 2 X
 - (B) /
- chemical
- long
- mechanical
- mechanical

- Chemical mechanical
 - 2 matter
- breaks down
- long
- Chemical weathering
 - Mechanical weathering
- 🚯 🐠 Because the biscuit is broken into small pieces, but it is still same material.
 - Because it produces a completely different new substance "dough".
 - Because chemical weathering causes a completely new different matter.
- 7) The material will not change and mechanical weathering occurs.
 - The materials will change and chemical weathering will happen.

Lessons 🚳 & 🗐

- - a d C C

10 /

- (3) a 源 b
- (B) a

X (B)

12 X

- (10) a
- (3) X Z X 41 /
- Erosion
- River
- Deposition

Gravity

- Delta
- 🐠 🕦 gentle wind hurricane **Egyptian Western Desert**
 - Nile delta
- water
- deposition
- (2) b (3) a
- Weathering
- 2 Deposition
- Deposition
- **Erosion**
- Deposition
- Erosion

- Because it pulls broken rocks down mountainsides.
 - 2 Due to the deposition of sand carried by the wind.
 - 3) Because deposition occurs when eroded sediment stop moving.
- Rain washes the soil, causing erosion.
 - 2 Sand will be deposited, forming sand dunes.
 - 3 It will form a delta.

Question (1)

- (A) (A) C

- (B) It will form a red -rust layer on rocks.

Question (2)

- (A) ∰ ✓
 - (2) X

- (B) Because oxugen gas reacts with iron found in rocks.

Question (3)

- (A) Tocks
 - 2 Limestone caves
 - 3 weathering
- expands
- (B) Lichens

Model Exam.

Question 1

- (A) (b)
- (2) d

(B) Erosion

Question (2)

- (A) (B) X
- (B) Digestion

Question (6)

- (A) (d

- (B) It will dissolve minerals of the rocks so the rocks become weaker and break down easily.

Compate 2

- ♠ ⊕ c⊕ c⊕ b⊕ d
- ON OX SX
- Canyon
 Wadi Nakhr canyon
 - Colored Canyon
- 4 Impression
 - brown and black colored
 - V-shaped
 - small canyon water stream
- ⑤ ⊕ c ② b 3 a
- 🚳 🐠 Gravity
- canyon million
 - Weathering erosion
- Because a stream of water may have formed it.
 - Because they have different rocks, texture, and color.
- It will leave impression and may form a small canyon.
 - The small canyon will get deeper.

Lesson 2

- 1) 1) a 2 b 3 b 4 c
 2 1) x 2 √ 3 x 4 √
- Weatheringdepositionmany years

- Because it helps us predict the future changes of landforms.
 - Because the river path may change and cause erosion and deposition of the house.
- 6 1. The house may get eroded.

Lesson 3

- 1 1 b 2 c 3 a 4 b 5 d 6 b 76 c 18 a
 - (R) d
- 2 1 x 2 √ 3 x 3 √ 5 √ 6 x 7 x 3 √
- 3 1 Gravity 2 Canyon
 - 3 The Grand Canyon
 - Rivers
- 4 1 gravity
 - (a) Increases more
 - 3 less sediments
 - 5 high many layers
- 5 1 x 2 / 3 / 1 /
- Because they are formed due to the erosion by rivers or streams.
 - 2) Due to the gravity.
- - The water speed increases causing more erosion.
 - The water of the river will cause more erosion.

Lessons 4 & 6

- 3 d (2) d 1 0 d (2) C (3) d
 - (a
- X 3 X 2 X O X (3) / (8) X (12) X
- Silts
- Delta

110 /

Mediterranean Sea

ID X

- Sand dune Wind erosion
- 🕢 🕦 canyon delta 🎱 fan
 - decreases deposition
 - increases
- 6 1 b (2) d C
- 🕜 🌓 delta deposition
 - area "C" area "B"
- (1) A

(2) B

(A) a

- 🔞 🐧 Because wetland plants slow down water and increase deposition rates.
 - Because river water speed decreases.
 - Because wetland plants are responsible for slowing down the water.
 - Because sand dunes are formed when a barrier like a rock blocks the wind.
- A delta is formed.
 - Sand grains will be deposited forming sand dunes.
 - Sand grains are blown from South to North direction.

Mouel Exam

Question ()

- (A) (c
- (B) The canyon will get deeper and becomes a bigger canyon.

Question (2)

- (A) (D)
- (B) Because the river may change its path and erode the house.

Question (6)

- (A) (h) sand dune
 - delta sediments
 - (3) less
- (B) Canyon

Model Exam

Question 1

- (A) (B) b
- (B) Weathering and erosion

Question 2

- (A) (B) X
- (B) Gravitu

Question 🕄

- (A) (b)
- (3) d
- (B) The sediments will be deposited and form a delta.

School Look

Assess Your Learning on Unit 4

- 1 (1) d
 - a d
- b

- (S) b
- (8) b III a
- (III) c
- ② Erosion of water (Valley)
 - Deposits of water (Delta)
 - Erosion and deposition due to wind (Sand dune)

Final Revision Model Answers

Unit 3

Concept 1

- ② ③ ✓ ② X ③ X ④ X ③ ✓ ③ X ⑦ ✓ ⑤ ✓ ③ X ◎ ✓ ① ✓ ② X ⑥ ✓ ④ ✓
- Mars Curiosity Rover
 - Chemical energy
 - The Sun
 - Thermal energy
 - Chemical energy
 - Energy chain
 - Electric lamp
 - Thermal energy
 - Minetic energy
 - Sound energy
 - Thermal energy
 - Thermal energy
 - Copper
 - (1) Thermal energy
- heat
 - sound kinetic
 - Coal
 - electrical output
 - electrical

- 6 Lamp
 - Light bulb
- (A) (D) a (2) C b (B) (B) d 4 b (C) (D) d (2) C (D) (C) (2) d (a) b (A) C Kinetic 2. (1) (1) - (3)(3) (2)
- (A) Chemical kinetic thermal
 - (B) Electrical light thermal
- Because the robot is very far from any store or any plug.
 - Because when the wood of the trees is burned, chemical energy stored in wood is changed into thermal energy.
 - Because the chemical energy stored in the food is converted into kinetic energy that helps your body move.
 - Because electrical energy changes into light and heat energies.
 - Because sound energy doesn't help the blender do its main function.
 - Because thermal energy helps the electric heater do its main function.

- (i) (ii) Kinetic energy changes to thermal energy.
 - 2 Electrical energy changes into light and thermal energies.
 - 3 Electrical energy changes into kinetic energy.
 - Some of the produced energy is lost in the form of heat.

Concept@

- (S) d (2) C a 🕦 🕼 d (6 d (B) a The CI 5 b (12) C 11 a 9 C 10 d 16 d 14 C 15 C 13 C 17 b 119 d 18 a 2 / 3 1 K W (B) / F X 5 X 12 1 400 / 91 (TO X 16 X 13 X 14 / 15 X 17 X
 - 1 Gasoline pointer
 - 2 Gasoline
 - 3 Chemical energy
 - Thermal energy
 - 5 Fuel
 - Nonrenewable resource
 - 7 Renewable resource
 - 8 Biofuel
- Fossil fuel
- 10: Oil (Natural gas)
- 11 Coal
- 12 Charcoal
- 13 Liquid fuel

- Electrical energy 15 Turbine
- **Generator**
- Global warming 18 Acid rain
- 19 Carbon dioxide
- 👍 🐧 wood coal
 - temperature pressure
 - renewable nonrenewable
 - steam generators
 - kinetic electrical
 - renewable 7 air
 - 8 water soil
- 6 wood
 - 2) oil underground
 - 3 deforestation
- (A) (B) b (2) c (3) d (B) a
 - (B) (B) c (2 a (3.) b
 - (C) 16 b 12 c 3 d 4 a a (C) 16 b 12 d 3 a 4 c c
 - Oll (2) Coal
 - (3) Charcoal
- To help the driver check the amount of gasoline (fuel) left in the car's fuel tank.
 - Because it starts to run out as we use it and can't be renewed easily.
 - Because it is renewed with the continuous growth of plants.
 - Because generators convert kinetic energy into electrical energy.

- Because it takes millions of years to be formed and starts to run out as we use it and can't be renewed easily.
- To reduce the burning of fossil fuels in normal vehicles and reduce air pollution.
- Chemical energy changes into thermal energy.
 - It leads to deforestation.
 - It produces thermal energy that changes the water into steam.
 - It turns into steam.
 - It may cause the decomposition of some rocks, including bricks of buildings.

Concept 3

- an a (#) b (8) C 10 b (III) b (d **9** d 2 / 3 X A X 6 1 優大 BX 12 / 10 X (M) X BA X 13 / 15 X
- Renewable energy resources
 - Concave mirrors
 - Wind turbine
 - Solar heater
 - Generator
 - Dam
 - Hydroelectric energy

- Maria electrical
 - kinetic electrical
 - less
 - mirrors sunrays
 - Greenhouses
 - move blow
 - wires
- **b** ② C (3) a
- **6 (1)**
 - **(1)** (2)
 - 3) their ways of working
 - the kinetic energy of the wind to be operated.
- (a) 3
- To grind grains to make flour.
 - To generate the electricity needed to light houses and operate different devices.
 - Because the atmosphere, water and soil absorb heat energy from the Sun.
 - lacksquare Because they help farmers in lacksquareplanting crops that need warm weather.
 - Because it changes the kinetic energy to electrical energy.
 - To control the flow of water and increase the gravitational potential energy of water to generate electricitu.

- The wind turbines will not move, so they can't generate electricity.
 - 2 They will rotate faster and produce more electrical energy.
 - The gravitational energy of water changes into kinetic energy to rotate the water turbines and generate electricity.

Unit 4

Concept 1

- a d (3) b (C (A) d (F) a B b (12) b 10 b (M) d .13 d (4) a (15) C A C 3 / 4 X (2) X (2) X (B) X (8) X (12) X (M) / 10 / 15 X 13 / (B) /
- Canyons
 - 2 Erosion process
 - 3 Deposition process
 - Chemical weathering
 - 5 Lichens
 - Oxygen gas
 - 7 Chemical weathering
 - Mechanical weathering
 - **9** Gravity
 - 10 River's water
 - 11 Deposition process
 - 12 Delta

- (A)
 plant roots
 - Acids
 - Acid rain
 - Mechanical chemical
 - oxygen iron
 - (B) (B) gentle wind hurricane Egyptian Western Desert
 - Nile Delta
 - water
 - deposition
- (3) (1) (2) (1) (1) (3)
- Because of many factors, such as wind, water and weather.
 - Because oxygen gas can react with the iron in the rocks forming red-colored rust, which makes the rock weaker and break down easily.
 - Because they produce acids on rocks that makes the rock weaker and breaks down easily.
 - Because chemical weathering changes the rocks structure and forms a new matter, while mechanical weathering doesn't change the rocks structure.
 - Because eroded rocks must be deposited after some time.
- The rocks become weaker and break down easily.
 - Acid rain will dissolve the minerals in rocks, so they become weaker and can be broken off more easily.

*

- The acids cause the breaking down of rocks.
- The cracks become wider, so the rocks break down easily.

Concept @

(2) C 10 (11) C (3) a a a **B** d 6 C √ b 9 C 10 a (II) d (12) d (13) d 14 C (15) b 16 a 2 1 X 2 X 3 / 41 5 X 6 X (Z) X BJ

00) X

15 /

13 x 12 x

Canyon

- Gravity
- 3 The Grand Canyon

10 X

- A Rivers (Streams)
- S Silt
- 6 Delta
- Erosion
- (A) (I) impression
 - brown and black-colored
 - 3 V-shaped
 - a small canyon water stream
 - (B) 1 gravity
 - 2 Increases more
 - 3 less
 - sediments
 - 6 high layers

- (C) 1 canyon delta
 - 2 fan
 - 3 decreases deposition
 - increases
- (A) (1) a 2 b (3) c
 - (B) 1) b 2 d 3 c 4 a
- **6** Gravity

12 X

16 X

- **♦** 10 x 2 √ 3 √ 4 √
- (B) (I) delta deposition
 - area "C"
 3 area "B"
- ② 1 A 2 B
- Because the river may change its path and cause erosion and deposition of the house.
 - Because they are formed due to erosion by rivers or streams.
 - Due to the erosion and deposition of the wind-blown sand.
- 🕕 🕦 It may form a small canyon.
 - This small canyon becomes deeper.
 - They will form a river causing more erosion.
 - Sediments will be deposited forming a delta.
 - Sand is deposited forming a sand dune.

Government Model Exams Answers

🚛 📗 Cairo Governorate – Exam 1 🦨

Question 1

- (A) (I) d
- (2) b

- (B) A small canyon may be formed.

Question @

- (A) (II) /

- (B) Due to the reaction with oxygen causing chemical weathering.

Question (3)

- (A) 1 thermal
- 2 warm
- (3) chemical
- gravity
- (B) Solar energy

2 Cairo Governorate - Exam 2

Question 1

- (A) (I) a
- (2) C
- (B) The sediments will be deposited forming a delta.

Question (2)

- (A) (B) X (2) X

- (B) Because they mix with the water in the canals causing water and soil pollution.

Question (

- (A) sand dune
- weathering
- natural gas
- valley
- (B) Natural gas

🖊 3 Cairo Governorate - Zeitoun Żone 4

Question 1

- (A) (b) b
- 2 a

- (B) Chemical weathering Mechanical weathering

Question @

- (A) (B) X

- (B) Wind, water, and the gravity

Question (3)

- (A) (II) Canyon
- Possil fuel
- Law of Conservation of Energy
- Dams
- (B) Delta

4 Cairo Governorate - Al-Azhar Al-Sharif

Question 1

- (1) C
- (2) b
- 30 b

Question (2)

- m b
- (2) d
- (3) C

Question (

- 10/2/

Question (4)

- 1 Biofuel
- 2 Kinetic energy
- 3 Weathering

Question 6

- 1 wood
- 2 Water
- 3 electrical

11 Alexandria Governorate – Exam 3 4 / 13

Question 1

(A) (D C

(2) a

3 c

a b

(B) To conserve electricity.

Question 2

(A) 1 Digestion

2 Glass

Acid rain

Fossil fuel

(B) Acids will eat away rocks so they become weaker and are broken down easilu.

Question (3)

(A) (I) /

x 3

x .

(B) Fuel

12 Dakahlia Governorate

Question 1

(A) (1) chemical

Natural gas

3 Canyons

Deposition

(B) It will dissolve the minerals in the rocks, so the rocks become weaker and break down easily.

Question 2

(A) (D /

2 X

3 1

AX

(B) Friction occurs between sand grains carried by wind and rock. This causes smoothing of rocks and breaking them down.

Question (3)

(A) 1- 1 Law of Conservation of Energy

Oxygen gas

2- 1 Electrical energy – Thermal energy

Chemical energy – Kinetic energy

(B) To control the water flow and increase its potential energy.

13 Suez Governorate

Question 1

(A) 1 b

2 d

(3) d

(4) a

(B) Because it reacts with the oxygen of the air.

Question 2

(A) ① /

2 X

3 7

4

(B) Charcoal

Question (3)

(A) 1 gently

2 Oil

renewable

deposition

(B) A delta will be formed.

14 Port Said Governorate

Question 1

(A) 1 d

(2) a

3 0

a

(B) Weathering

Question @

(A) (B X

2

3

(A) 1

(B) Because Iron reacts with oxygen.

Question (3)

(A) Mars

2 renewable

3 rocks

Increases

(B) A canyon will be formed.

15 Behira Governorate

Question 1

(A) (C

3

2 b

3 0

b

(B) Law of Conservation of Energy

Question 2

(A) ① X

2 1

3 /

41

(B) Irritation of eyes and lungs – Damage of lungs – Heart diseases

Question (3)

(A) (1) C

2

(3)

(4) b

(B) Generator

🚀 🎝 🕽 Giza Governorate – Exam 1 🌽

Question 1

- (A) (1) C
 - (2) a
- 4 a

(B) oxygen

Question (2)

- (A) 1 / 2 /

- (B) Sediments will be deposited forming a delta.

Question (3)

- (A) Water
- 2 biofuel
- 3 Sun
- **a** sound
- (B) Acid rain

6 Giza Governorate – Exam 2

Question 1

- (A) (iii) X

- (B) the erosion and deposition of the wind-blown sand

Question (2)

- (A) (b)

- 4 C

(B) delta

Question (6)

- (A) (B) C
- (2) a
- (3) d
- (B) weaker and break down easily.

🖊 🚺 Giza Governorate – Exam 3 🗸

Question 1

- 1 Chemical energy
- Global warming
- 3 Electrical energy
- Sand dunes
 Substituting

Question (2)

- (II) X

5 X

Question (6)

- (A) (C
- (2) a
- (B) Solar water heater
 - solar thermal

Qalyubiyya Governorate

Question

- (A) (D d

- (B) Photosunthesis

Question (2)

- (A) 1 / 2 X

- (B) Chemical weathering

Question (3)

- (A) (II) d (2) c
- (3) b
- (B) Oil Nautural gas

🚀 Alexandria Governorate – Exam 1 🐇

Question 1

- (A) (b) (2) d
- (3) d
- (B) As they grow inside rock cracks, the cracks become wider, causing breaking down of rocks.

Question 2

- (A) 1 thermal
- smog
- 3 mechanical
- erosion
- (B) It will cause chemical weathering.

Question (8)

- (A) 1 / 2 X
- (B) Fossil fuel

10 Alexandria Governorate – Exam 2 4

Question 1

- (A) (1) charcoal
- 2 Sun
- 3 electric lamp
- Copper

(B) /

Question 2

- (A) (1) a
- 3 b

(B) Sound energy

Question (3)

- (A) (I) C
- 2 d

- (B) Because it reacts with oxygen.